

The Annals

OF

Scottish Natural History

A QUARTERLY MAGAZINE

WITH WHICH IS INCORPORATED

"The Scottish Naturalist"

EDITED BY

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1911



EDINBURGH

DAVID DOUGLAS, CASTLE STREET

LONDON: R. H. PORTER, 7 PRINCES ST., CAVENDISH SQUARE





The Annals of Scottish Natural History

No. 77]

1911

[JANUARY

BIRD NOTES FROM THE ISLE OF MAY —AUTUMN 1910.

By EVELYN V. BAXTER and LEONORA JEFFREY RINTOUL.

WE again visited the Isle of May this autumn and worked there from the 2nd September till the 18th October. During this time we were able to record 99 species, three of which were new to Forth, and after we left two other Forth novelties were sent off to us. With its usual sweet reasonableness the wind, after having been in the east almost all summer, veered round and blew off the west for all but the last few days of our visit. Occasionally there were easterly airs below, but the upper currents were still off the west; the weather throughout was very fine and mild. These conditions militated against rushes of migrants, and it was not till the last few days of our stay, when an honest east wind set in, that any great numbers of birds appeared. It being impossible, in the space at our disposal, to enter into detailed accounts of the movements of each species, we propose to deal briefly with some of our more outstanding records.

Among the Turdinæ, Missel Thrushes (*Turdus viscivorus*) appeared more plentifully than in other seasons, though never in any great numbers, and there were Song Thrushes (*Turdus philomelos*¹) on the island almost every day.

¹ The nomenclature adopted is mainly that of Dr. Hartert's "Die Vögel der paläarktischen Fauna."

Rushes of this species occurred on 11th, 16th, 25th, and 30th September, and 1st, 7th, and 10th October, and a very pronounced one on the 11th; we procured Thrushes out of each rush, but they all proved to be of the British racial form *T. philomelos clarkei*. It may be worth recording here, that among the Song Thrushes procured in the autumn of 1909 on the Isle of May, there were several belonging to the foreign race *T. philomelos philomelos*. The first Redwing (*Turdus musicus*) appeared on 27th September, on 7th October a good many arrived, from the 12th to the 15th there were numbers present, and on 16th October (S.E. wind, very light, hazy) a great rush occurred. The birds came in from the north during the whole day, most plentifully in the morning, and in addition to those that alighted on the island, we saw and heard countless numbers passing overhead. A Fieldfare (*Turdus pilaris*) was seen on 25th September, an unusually early date; we saw no more till 11th October, after which they occurred daily. From 14th to 17th October, with an easterly wind, great rushes of Blackbirds (*Turdus merula*) took place, the dome of the lighthouse being thronged with them in the early mornings, and the island covered with them; almost all were young males with black bills. No Thrushes arrived during these Blackbird rushes. Ring Ouzels (*Turdus torquatus*) occurred in small numbers between 25th September and 17th October. One of the features of this season was the number of Greater Wheatears (*Saxicola ænanthe leucorhoa*); they occurred almost daily from 6th September till 12th October, and we noted that they very often arrived during the day, usually about 4 p.m. These birds were very fond of hiding under stones, and would often crouch down in the rubble underneath some big block, and refuse to move till we were within about two feet of them. Once a Greater Wheatear perched on one of the chimneys of the lighthouse. *Saxicola ænanthe ænanthe* was not at all plentiful on the island this season. A good many Whinchats (*Pratincola rubetra*) were present on 11th September, and we saw a few on other dates between the 2nd and 26th; four Stonechats (*Pratincola torquata*) were also seen.

Redstarts (*Phœnicurus phœnicurus*) were remarkably scarce, and we only saw one Red-spotted Bluethroat

(*Luscinia svecica*): it appeared on 10th September and was as wild as a hawk. On the other hand, Redbreasts (*Erithacus rubecula*) were more plentiful than usual throughout our stay, and occurred in numbers during the last fortnight of October after we had left the island. Four procured and submitted to Dr. Hartert were pronounced by him to be of the British race *Erithacus rubecula melophilus*.

Most of the Warblers were uncommonly scarce; we saw a few Whitethroats (*Sylvia communis*) between 6th and 20th September, only one Lesser Whitethroat (*Sylvia curruca*) on 13th September, a male Blackcap (*Sylvia atricapilla*) on 2nd October, and a female on the 17th, and Willow-warblers (*Phylloscopus trochilus*) between 4th and 26th September; there were a good many on the 6th and 15th, otherwise only one or two. The only new Warbler that occurred was the Siberian Chiff-chaff (*Phylloscopus collybita tristis*), a single bird appearing on 16th October (S.E. wind, very light, hazy). We managed to procure it, and it constitutes the first record for Forth, the only others known to occur in Britain being at Sule Skerry, Fair Isle, and Kirkwall. In contradistinction to last year we were not able to record a single Yellow-browed Warbler, while Chiff-chaffs and Garden-warblers were also conspicuous by their absence.

There were more Goldcrests (*Regulus regulus*) on the May this season than we have ever seen there before; the largest arrival took place on 14th October, when the island was swarming with these attractive little birds. We procured eight on various dates between 10th September and 17th October, and all proved to be the continental *Regulus regulus regulus* except one, a British example, *Regulus regulus anglorum*, secured on 15th September. Hedge Accentors (*Prunella modularis*), too, were unusually plentiful, a good many being present on 7th and 9th October. Those sent to Dr. Hartert proved to be the British race, *Prunella modularis occidentalis*, excepting one procured on 6th October, which Dr. Hartert pronounces to be a "puzzling specimen, too pale for *occidentalis*, probably *P. m. modularis*." A continental specimen of the Great Titmouse (*Parus major major*) arrived 15th October; it is an addition to the list of birds seen by us on the May. As usual, White Wagtails (*Motacilla*

alba alba) and Tree-pipits (*Anthus trivialis trivialis*) passed in small numbers, but Pied and Spotted Flycatchers (*Muscicapa atricapilla* and *striata*) were very uncommon, the former only appearing on 4th and 24th September. We saw more Swallows (*Chelidon rustica*) than in any previous season, hundreds passing on 6th and 16th September and smaller numbers being often seen; in almost every case these birds left the island before mid-day.

Siskins (*Acanthis spinus*) were first seen on 14th October; a month later this species was still present on the island. Many Mealy Redpolls (*Acanthis linaria linaria*) occurred; on 14th October two came in, and another on the 16th. During the fortnight after we left there was an immigration of this species and several were sent to us, all procured being *linaria linaria*. Holböll's Redpoll (*A. linaria holbælli*) was procured, and sent, on 23rd October. Chaffinches (*Fringilla cælebs cælebs*) in small numbers might be seen most days after 3rd October, and Bramblings (*Fringilla montifringilla*) were fairly plentiful; one or two arrived on 25th September, and from 2nd October till we left they occurred in varying numbers; on the 11th they were arriving in flocks all day. We are indebted to Mr. Ross and Mr. Baigrie for having procured and sent off to us several Northern Bullfinches (*Pyrrhula pyrrhula pyrrhula*); on 22nd October we received a beautiful male, and the wings and tail of another, which from the description sent with it was evidently a female; on the 26th we received two more, a male and a female, and on 2nd November yet another male. This is the first time that the Northern Bullfinch has been recorded in Forth. The only Scarlet Grosbeak (*Carpodacus erythina*) seen appeared on 7th September. We procured it, though, it was much wilder than we have found this species on other occasions; it was in the green type of plumage.

Buntings were fairly well represented this year and were dreadfully wild. Two Yellow-hammers (*Emberiza citrinella*), one being a male in splendid plumage, appeared on 11th October, and this species (uncommon on the May) was seen again on 15th and 17th October. Twice we saw Ortolan Buntings (*Emberiza hortulana*), but they were so very wild that we never managed to get within reach of them; this

species is not new to the island, having been procured there by Mr. Agnew in May 1885. Reed Buntings (*Emberiza schæniclus*) appeared on 16th and 17th October, and a Lapland Bunting (*Calcarius lapponica*) on 4th October (W. wind, strong). We secured this bird, which proved to be a young female, and is the first authenticated record for Forth. We saw one on the island in 1907, but as we failed to procure it the record was not confirmed. Great numbers of Starlings (*Sturnus vulgaris*) appeared along with the Black-bird rush from 14th to 17th October; and on the latter date we saw two Jackdaws (*Colæus monedula*); one was the usual type of bird seen here, but the other had a broad white collar, it may have been the east European form *Colæus monedula collaris*, but unfortunately we were not able to secure it.

Skylarks (*Alauda arvensis*) passed fairly constantly, but there was no big rush, and a Wood-lark (*Lullula arborea*) appeared on 16th October, and next day we secured it. It is new to the fauna of Forth. We had no difficulty in distinguishing it from a Skylark by the noticeably shorter tail, and also by the note, which it uttered constantly and so attracted our attention. A Swift (*Cypselus apus*) on 3rd September was an addition to the list of birds seen by us on the island. On 1st October, a very hot day, we were just going into the lighthouse to lunch when a Hoopoe (*Upupa epops*) flew over our heads; needless to say we immediately gave chase. In Saunders's "Manual" this bird is referred to as "tame and confiding," but our Hoopoe was most uncommonly well able to take care of itself. It never let us get within a hundred yards of it, but with our glasses we were able to see it very well as it strutted about on the grass probing the ground with its bill, its crest half-erected and the bold black and white banding on the wings showing most distinctly. When flying it was constantly chivied by the Pipits and other small birds. Next morning it was seen about six o'clock, after which it no doubt proceeded towards its winter quarters, and, we hope, reached them safely. There is one previous record of a Hoopoe for the island, a female having been procured there on 30th April 1898.

Several Short-eared Owls (*Asio flammeus*) were seen, both during our stay and after we left, while Peregrines

(*Falco peregrinus*), Kestrels (*Falco tinnunculus*), and Merlins (*Falco æsalon*) were observed, doubtless preying on the smaller migrants.

There is nothing new or strange to record among the Anatidæ, but a Stock-dove (*Columba ænas*), seen on 18th September, is an addition to our island list, as is a Bar-tailed Godwit (*Limosa lapponica*), seen on 24th September. On the whole, Waders were scarce, with the exception of Turnstones (*Arenaria interpres*) and Curlew (*Numenius arquata*), of which we saw a good many. Several Lesser Black-backed Gulls (*Larus fuscus*) appeared in September, an immature Glaucous Gull (*Larus hyperboreus*) on 13th October, and an adult bird next day. Towards the end of our stay we saw enormous flocks of Kittiwakes (*Rissa tridactyla*). A Great Skua (*Megalestris skua*) appeared on 3rd October, and towards the end of our visit there were vast numbers of Razorbills (*Alca torda*) and Guillemots (*Uria troille*) in the sea close to the island; they, as well as the Kittiwakes, were no doubt feeding on the shoals of small silvery fish with which the sea swarmed, many being cast up in the harbour. A little Grebe (*Podiceps fluvialis*) was seen on 16th and 17th October, and a Storm Petrel (*Thalassidroma pelagica*) was killed at the lantern late in the month, while on the morning of 16th October we watched a Sooty Shearwater (*Puffinus griseus*) for some time flying about close to the island.

We must again express our indebtedness to the Commissioners of Northern Lights for their kindness in giving us permission to live and work on the Isle of May. Our time there was full of interest and pleasure, and we greatly appreciate the privilege which has been accorded us. It is impossible adequately to thank our friends on the May for all their kindness to us, but we wish to express our gratitude as well as we can to Mr. and Mrs. Ross, Mr. and Mrs. Baigrie, Mr. and Mrs. Wilson, for all they did for us while we were on the island, and for birds sent since we left, and for this last we have also to thank Mr. and Mrs. Macleod. We hereby tender our warmest thanks to Dr. Hartert, who most kindly examined our skins and determined some of the racial forms for us, and to Mr. Eagle Clarke for all his help and kindness.

HERONRIES IN DEE, ETC.

By A. LANDSBOROUGH THOMSON.

MR. BOYD WATT'S interesting supplementary list of Scottish Heronries in the April issue of the "Annals" (1910, pp. 68-70) has drawn my attention to his original list ("Ann. Scot. Nat. Hist.," 1908, pp. 218-223), and I have noticed some omissions from the "Dee" section which the second list has not made good. As a result of further inquiries I have discovered several other omissions; but I am not surprised that Mr. Watt's information was incomplete, for many of the facts, although they relate to my own district, are quite new to myself, and some of them were only ascertained with difficulty, although I am well placed for making inquiries as regards the area. And I am, moreover, by no means satisfied that the following amended list is exhaustive, more especially as regards the north-eastern portion of "Dee":

QUEEN'S HILL, ABOYNE.—According to my friend Mr. A. M. Wilson, M.A., there were 14 nests in 1907, and I believe there were about the same number in 1908. The heronry is doubtless still flourishing. It is one of the most important omissions from Mr. Watt's lists.

BLACKHALL, BANCHORY.—In Mr. Watt's first list.

EDINGLASSIE, STRATHDON.—Also in Mr. Watt's list. My friend Mr. Ian G. Innes tells me that there were between 6 and 9 nests in 1908.

MONYMUSK.—This is apparently a new heronry. Captain Arthur Grant writes that it was first known of in 1908, comprised 4 nests in 1909, and 5 nests this year. The nests are in larches.

LEITHHALL, KENNETHMONT.—An old-established heronry not mentioned in either of Mr. Watt's lists. There are at present about a dozen nests. According to Mr. Leith Hay, the birds shifted to their present wood about ten years ago. Curiously enough it was the season *before* the old wood was destroyed by a wind storm.

KEITHHALL, INVERURIE.—There are at present about 14 nests divided between two places. A third spot close at hand was tenanted by a few pairs up till about nine years ago. The nests are in silver firs.

PITMEDDEN.—A small heronry not mentioned in Mr. Watt's lists. It was formerly larger, but has apparently not prospered since as Mr. Alexander Reid tells me, a wind storm several years ago blew down many of the trees.

HADDO HOUSE.—In Mr. Watt's first list.

PITFOUR.—Mentioned in the supplementary list as having been tenanted by a few pairs about ten years ago. I am glad to say that the colony still exists: this season there were 14 nests, but apparently only between 8 and 10 pairs of birds. The strength of the colony is believed to have remained very much the same for several years. The present nests are all in high beech trees, but formerly there were some "in shrubs on the island."

*PARKHILL.—In Mr. Watt's original list, but now, I regret to say, extinct. It is the only heronry which the late Mr. George Sim mentioned in his "Vertebrate Fauna of 'Dee'" (1903), and that only to say that it was on the verge of extinction at the hands of local egg-collectors.

*SCOLTIE HILL, BANCHORY, and *GIGHT.—Are former sites, mentioned as such in Mr. Watt's first list.

*Near HUNTLY.—Traditional site referred to in the supplementary list. The following three traditional sites are not given in either list.

*BALMUIR, DUNECHT.—A few pairs nested in old spruce trees there for a few years until the trees were blown down "in the gale of 1860."

*LOGIE ELPHINSTONE.—According to the present keeper, there was a heronry at this place many years ago.

*CASTLE FRASER.—A former heronry in Scots pines there has been extinct for at least thirty years, although a pair is occasionally known to nest in the district.

We have thus in "Dee" at present 9 tenanted heronries and a heron population of about 80 breeding pairs. I owe much of the above information to the generous help of Miss D. Hamilton of Skene and Mr. Wm. Seton Meston, Inverurie. I must also express indebtedness to all the informants mentioned and to the gamekeepers of several of the estates.

While collecting the above data it has struck me that the Heron would lend itself most admirably to a statistical study which might possibly prove of great interest. I therefore venture to suggest to Mr. Boyd Watt and others interested

in our heron population, that a census of Scottish heronries might well be extended into a census of the birds themselves. A census made at an early date might, I believe, be profitably taken and published for comparison with similar censuses to be taken later at intervals of several years. An annual census would probably prove neither practicable nor repaying, but a census taken for two or three years in succession, followed by a long gap, would give very reliable average figures. The suggested work might be made practicable by dividing it, according to faunal areas or other divisions, among any who were interested in the scheme. These might begin by making sure that their lists of heronries were exhaustive, by collecting further details as to the past histories of the colonies, and by arranging with local observers who would be willing to report the desired figures in the season or seasons fixed for the census. I beg to leave this suggestion in the hands of those interested, but expressing my readiness to assist in any such scheme.

OLD ABERDEEN.

[Mr. Thomson's recommendation regarding a census of Heronries and Herons is of interest and may well be of value. If gone into—say by Mr. Boyd Watt, or other gentlemen having intimate personal acquaintance with the whole of Scotland—such might prove most useful. We may suggest a good starting-point for future comparison, *e.g.* the "Vertebrate Fauna of Scotland," eleven vols. (Douglas and Foulis), where the Heronries of such areas as have been treated of, between 1888 and 1906, are pretty accurately and, *we believe, fully* detailed. We have no desire to blow our own whistle too shrilly, but as Mr. Thomson makes no allusion to these volumes it appears that he must be unacquainted with them. There is also an older article upon "The Heronries of Great Britain" by Mr. J. E. Harting, which appeared in the "Zoologist" when Mr. Harting was editor of that old and well-known journal, and which should be consulted.

With regard to heronries in Dee, that mentioned under Blackhall, Banchory, originally "migrated" suddenly from Scoltie Hill, Banchory, after the occasion of the cutting

down of the pine trees on the latter estate. The two estates adjoined at the time we speak of, and the Scoltie Hill heronry was placed close up to the march which separates the two properties. This would be about the years 1863 to 1865, when the writer of this note and a friend took eggs there. It would be, I think, about three years later, say 1866 to 1869, when the wood was cut, and the birds decamped across the march and took up their new abode in Blackhall.

I remember hearing of the "traditionary site" near Huntly, and others.

There is one quite flourishing heronry about five miles up the river Deveron, above Turriff, placed in very dense-growing spruce fir trees, on the Netherdale property. A peculiarity about this heronry is the very diminutive size of the eggs of the birds. I forget whether I have actual measurements, but when a young friend of mine took eggs on more than one occasion, both his father and myself were greatly struck with their very small size. The birds—old and young—were constantly to be seen wading in the shallows of the river Deveron, especially at the time of the descent of the sea-trout "finnochs" and smolts, and the *ascent* of the Elvers or young eels. This occurred with great regularity every year during the six years we fished that part of the river Deveron, and was most noticeable after the 12th and 14th May.—J. A. H.-B.]

THE GIANT PIKE OF LOCH KEN.

By C. TATE REGAN, M.A.

THE size attained by any species of fresh-water fish varies greatly according to locality, the factors of chief importance being probably the quality and amount of the food and the number of fish. When circumstances are favourable, that is, when food of the best sort is abundant and the fish which require it are not too numerous, a size may frequently be reached which may be called the normal maximum for the species, when it seems probable that growth ceases

because the annual loss of weight entailed by spawning can only just be made good during the period of active feeding.

I take it that $2\frac{1}{2}$ lbs. for Roach, 4 lbs. for Perch, and 40 lbs. for Pike, are weights not far from the normal maxima; in the best waters they are frequently reached, but rarely passed. Nevertheless, under exceptionally favourable conditions, or in fish of remarkably vigorous constitution, these weights may occasionally be greatly exceeded, and there is good reason to believe that Roach may grow to nearly 4 lbs. and Perch to twice that weight.

If it be the case that in recent years there is no properly authenticated instance of the capture of a Pike of more than 45 lbs. in the rivers or lakes of the British Isles, still the well-established records of Pike of from 35 to 45 lbs. are so numerous that one can only think it probable that a much greater size may occasionally be attained.

Thus tales of Pike of from 50 to 100 lbs. weight from British waters are not to be dismissed on *a priori* grounds; on the other hand, they need not be accepted unless there is some evidence of their truth.

Ireland has always been held in repute as the home of monster Pike; one of more than 90 lbs. was said to have been taken in the Shannon nearly a century ago. Thompson, in his "Natural History of Ireland," wrote: "The Rev. C. Mayne, writing from Killaloe in 1838, gave me the names of two gentlemen who killed pikes of 49 and 51 lbs. weight in that locality, and also informed me that, in August 1830, Mr. O'Flanagan (then aged 70) killed with a single rod and bait, in a lake in the County Clare, a pike of 78 lbs."

In the second volume of the Rev. W. B. Daniel's "Rural Sports" (1801-1813) are details of several large Pike, and the measurements of one of these (from eye to fork, 4 feet 1 inch; extreme length, 4 feet 9 inches; depth $11\frac{1}{2}$) agree so well with the weight, said to have been 2 ounces short of 50 lbs., that both may be believed to be accurate; this fish was taken by trolling in Loch Petuliche in 1784, the angler being Colonel Thornton. The same book gives what I believe to be the first notice of the celebrated Kenmure Pike, which reads as follows: "Another

way of taking the Pike is with an *artificial fly* ; many have asserted that they are not to be caught at all with a fly, but, as a convincing proof to the contrary, the engraving of the skeleton of the *head* of a Pike is given, which is the biggest taken by a line, or perhaps ever known in this country, and which was caught in *Loch Ken*, near *New Galloway*, in Scotland, with a common *fly*, made of the *Peacock's* feather ; it weighed *seventy-two pounds* ; the skeleton of the head is at *Kenmore Castle* ; the jaw at the top is that of a *Pike*, weighing *twenty-five pounds* ; a scale is annexed, by which the respective proportions of the two may be ascertained and which will convey some idea of the largest Pike ever seen in Great Britain."

Most authors have given the weight of this Pike as 72 lbs., but it is as well to point out that one early writer differs from them, viz., Dr. Grierson, who published some 'Mineralogical Observations in Galloway' in the "Annals of Philosophy" for 1814, with the following in a footnote: "I have very often killed in Loch Ken perch weighing four pounds, and at one time a pike of seven ; but this is nothing in comparison of one that was caught about forty years ago in this lake, by John Murray, gamekeeper to the Hon. John Gordon of Kenmore. It weighed 61 lbs. and the head of it is still preserved in Mr. Gordon's library at Kenmore Castle."

This Pike from Loch Ken differs from other immense Pike which have been recorded from time to time, in that a part of the fish is still extant to bear witness to its size, and one of the objects of a recent visit to Galloway was to look at these remains and to try and form an opinion as to whether the fish had actually weighed sixty or seventy pounds when caught. I was permitted to examine the incomplete skeleton of the head in Kenmore Castle, and I took several measurements ; I was also allowed to do the same with some heads of large Pike from Loch Ken, the property of Sir Arthur Henniker-Hughan, Bart., in his house at Parton.

Before giving details of these measurements I must call attention to the fact that the size of the head is a very uncertain indication of the weight of the fish. The head is

proportionately larger in males than in females, and Pike from lakes or rivers where food is abundant and a large size is often reached are smaller in the head than the occasional big fish taken in ponds of no great extent. Moreover, the relation of weight to length varies enormously according to the season and the condition of the fish. This is strikingly exemplified by three casts of Pike in the Buckland collection; one, a spent fish of $20\frac{1}{2}$ lbs. caught on 12th May 1879, is very similar in all its proportions except depth and girth to a ripe female of 32 lbs. taken in Norfolk on 25th March 1870; whilst between them is a fish only slightly longer, but with a notably larger head; it is very thin and can scarcely have weighed more than 20 lbs.; it was found dead in a pond at Claremont.

In this connection the following extract from the Rev. Richard Lubbock's "Fauna of Norfolk" is of interest:—"The largest-framed fish I ever beheld, was found in the reeds on the verge of a broad in the summer of 1822; the water had receded so as to make him prisoner in a place so shallow as not to cover his back fin. Emaciated as he was—for his head was far the largest part about him—he weighed twenty-one pounds, and would in very high condition, I am certain, have reached thirty-five. He was accurately measured before being turned loose, and was forty-three inches in length."

I may now give the principal measurements in inches of the heads of three large Pike from Loch Ken:—

	<i>A.</i>	<i>B.</i>	<i>C.</i>
Total length (from level of end of snout to extremity of operculum)	11	12	
Length on upper surface from anterior edge of vomer to posterior edge of frontals	$7\frac{4}{5}$	$8\frac{1}{2}$	$8\frac{1}{2}$
Greatest width across frontal bones	$2\frac{3}{4}$	3	3
Length of maxillary	$4\frac{5}{8}$	5	5
Lower jaw (measured in a straight line from symphysis to angle)	$8\frac{1}{4}$	$8\frac{3}{4}$	$8\frac{3}{4}$

Under (*A*) are given the measurements of the head of a Pike caught in June 1898 which weighed 37 lbs., and would no doubt have weighed a good deal more if it had been taken three or four months earlier or later. This and

the next are the property of Sir Arthur Henniker-Hughan, Bart., to whom I am greatly indebted for information concerning the second fish (*B*). It was taken in the summer of 1904, when a porter at Parton station saw it stranded near the edge of Loch Ken, either dead or dying, and took it out of the water; the fish was in an emaciated condition and weighed only 39 lbs.

The circumstances of the capture of this fish resemble those related by Lubbock for his 21 lb. Pike,¹ and if his estimate of the probable weight of that fish in good condition is approximately accurate, then we must admit the possibility that the Loch Ken fish of nearly twice the size might perhaps have weighed about 70 lbs. before it deteriorated. Now the measurements of the head of this fish (*B*) are precisely the same as those of the Kenmure specimen (*C*), and we may take it that the latter may possibly, if it were a female fish captured during the winter months, have weighed as much as 72 lbs. and that in all probability, unless it was out of condition, it did weigh 61 lbs.

BRITISH MUSEUM (NATURAL HISTORY).

SCOTTISH DRAGONFLIES; SOME FURTHER RECORDS AND TABLE OF DISTRIBUTION.

By WILLIAM EVANS, F.R.S.E.

THE perusal of Mr. W. J. Lucas's 'Scottish Dragonfly Records' in the "Annals" for July last led me to look through my specimens and notes for records outside of "Forth," or subsequent to the publication, in 1905, of my list for that Area in the "Proceedings of the Royal Physical Society of Edinburgh" (xvi. 87-96). This done, it occurred to me that in other private collections and in our public museums there were doubtless many unpublished records to be had for the asking. Inquiries were accordingly

¹ Except that Lubbock's fish appears to have been starved, whilst the Loch Ken one does not seem to have been cut off from the deeper water, and the cause of its deterioration and death are unknown; possibly it may have perished simply from senile decay.

made in a number of likely quarters, the result being a large augmentation of data.

The records thus obtained are given below, arranged under species, and the county or vice-county (Watsonian scheme) to which they respectively refer.

My best thanks are due to those friends and correspondents who have been good enough to send me specimens or otherwise supply me with records. In doing so they have not merely obliged me, but they have the satisfaction of knowing that they have been instrumental in helping to remove the reproach contained in Mr. Lucas's remark in his paper that our knowledge of the distribution of this interesting order of insects in the northern part of the United Kingdom "is meagre in the extreme." In most cases one or more specimens have been examined by me in support of the record, and in all the name of the collector is given. Of course, in the case of records supplied by experts in the group, such as Mr. Morton and Mr. King, further authentication was unnecessary. For the records from the Royal Scottish Museum, Edinburgh, I have to thank Mr. P. H. Grimshaw, who has also kindly shown me the dragonflies he collected in the Outer Hebrides last summer. As regards the specimens in the Perth Museum I am likewise much indebted to Mr. A. M. Rodger, Curator, for a list of those preserved in that institution, and for granting me every facility for their inspection.

On hearing from Mr. Rodger in August last that Dr. Buchanan White's dragonflies from Colvend, Kirkcudbrightshire, were still to the fore in the Perth Museum, I at once went there and made a personal examination of them. Specimens of the following ten species are labelled in Dr. White's own writing, "C. 70," which stands for Colvend 1870:—*Sympetrum striolatum*, *S. scoticum*, *Libellula quadrimaculata*, *Orthetrum cærulescens* (three, 1 ♂ 2 ♀), *Æschna juncea*, *Calopteryx virgo*, *Lestes sponsa* (ten; named *L. nympha*), *Pyrrhosoma nymphula*, *Ischnura elegans*, and *Enallagma cyathigerum*. There is also along with these an *Æschna grandis* ♂, which Mr. Rodger concludes is also a Colvend specimen, though it wants the C. 70 label, since it completes the list contributed by Dr. White in 1873 to

M'Diarmid's "Handbook of Colvend and Southwick." On the pin beneath it is a label bearing the name *grandis* apparently in the late R. M'Lachlan's writing. But quite apart from this specimen there are, I think, good grounds for admitting the record.¹ The ten specimens over the name *Lestes nympha* are clearly all referable to *L. sponsa* (Hansemann), and not to *L. dryas*, Kirby, so that the doubt previously attaching to this record is now removed, and with it the only claim of the latter insect to a place on the Scottish list.² The substantiation of Dr. White's record of *Orthetrum cærulescens* is especially gratifying.³

Mr. King's records of *Agrion pulchellum*, here published for the first time, are particularly interesting as affording confirmation of De Selys's statement that he had observed this species in Scotland in 1845.

LEUCORRHINIA DUBIA (*Lind.*).—*Mid Perth*: Tyndrum, 1895, ♀ (T. M. M'Gregor; in Perth Museum). *East Ross*: Kindace Moor, 26th June 1908, ♂ and ♀ (sent to me by Miss A. C. Jackson, Swordale).

SYMPETRUM STRIOLATUM (*Charp.*).—*Westerness*, i.e. *West Inverness*: Invermoidart, 1900, ♀ (received from S. M. Macvicar). *Main Argyll*: Oban District, July 1874 (W. E.); Loch Aline, Morven, July 1895, ♂ (from C. Campbell). *Mid Ebudes*: Glen Aros, Mull, 6th August 1906, ♂ and ♀ (from J. W. Bowhill). *West Ross*: Kinlochewe (J. J. F. X. King).

S. SCOTICUM (*Don.*).⁴—*Kirkcudbright*: Kirkcudbright (King). *Berwick*: near Ayton, September 1895, ♀ (W. E.); Moor near Earlston (W. Pringle).⁵ *Stirling*: two from the western section of the county (from D. Gourlay). *Mid Perth*: Aulich, Rannoch, August 1881 (W. E.); near Ballinluig, 1895 and

¹ De Selys states ('Ann. Mag. N.H.,' 1846) that he saw *Æ. grandis* from Scotland in Dr. Greville's collection.

² I have been enabled to submit one of the specimens to Mr. Morton and he also identifies it as *L. sponsa*. For remarks on Buchanan White's Colvend list, cf. Morton, 'E.M.M.,' 1900, p. 108.

³ Besides the Colvend specimens there are examples of the following species in Dr. White's collection, labelled "F. 69," i.e. Glen Farrar (Strathglass, Inverness-shire), 1869:—*Libellula quadrimaculata*, *Somatochlora metallica*, *Lestes sponsa* (named *nympha*), and *Pyrrosoma nymphula*.

⁴ Mr. K. J. Morton has drawn my attention to Dr. Ris's adoption of *S. danae* (Sulz.) as a prior name for this species (see "Die Süßwasserfauna Deutschlands," Heft 9, 'Odonata,' 1909).

⁵ This record may belong to Roxburgh, the county boundary passing near Earlston.

1898 (T. M. M'Gregor and A. M. Rodger; in Perth Museum); Loch Whirr, east of Glenfarg, September 1899, Common (W. E.); near Tummel Bridge, 25th July 1905 (K. J. Morton); Methven Moss, 1905 (W. Wylie; in Perth Museum). *N.E. Perth*: Glen Fender, near Blair Atholl, 25th Sept. 1898, ♂ (W. E.); near Blairgowrie, Sept. 1910, ♀ (from A. E. J. Carter). *Forfar*: two "Forfarshire" specimens, ♂ and ♀, have been shown to me by Mr. W. Duncan, Montrose Museum (W. E.). *S. Aberdeen*: Lumphanan, July 1910 (K. J. Morton). *Elgin*: Cromdale, August 1891 (W. E.). *Easternness*, i.e. *East Inverness*: Kincaig, near Kingussie, August 1889 (W. E.). *Westernness*: Invermoidart, 14th Sept. 1900, two ♀ ♀ (from S. M. Macvicar). *Main Argyll*: Ben Doran (J. J. F. X. King); Glenmorven, Sept. 1909, ♂ and ♀ (from J. W. Bowhill). *Clyde Isles*: near Millport, Cumbrae, 1904, two (from D. Gourlay). *S. Ebudes*, i.e. *South Inner Hebrides*: Machrie, Islay, August 1904, several (from Miss Ethel Evans); Jura, Sept. 1907 (Rev. J. Waterston, *vide* Morton). *Mid Ebudes*: Tobermory, Mull (King); Loch Freisa, Mull, August 1905, common (from J. W. Bowhill). *E. Ross*: Swordale, July, ♀, and September 1907, ♂ (from Miss Jackson). *Caithness*: Watten, 26th Sept. 1910, ♀ (from Rev. D. Lillie).

LIBELLULA QUADRIMACULATA, L.—*Renfrew*: Kilmalcolm, 1910 (in Kelvingrove Museum, Glasgow). *Mid Perth*: Tyndrum, 1895 (T. M. M'Gregor; in Perth Mus.). *Easternness*: Loch Alvie, near Aviemore, 9th of May 1893, five (W. E.); Glenferness, Nairn, July 1901 (from C. Campbell). *Westernness*: Invermoidart, 28th June 1902, three (from S. M. Macvicar). Loch Aline, Morven, July 1895, ♀ (from C. Campbell). *S. Ebudes*: Colonsay, June 1882, two caught and others seen (W. E.). *Mid Ebudes*: Tiree, June 1900 (from J. Baxter). *W. Ross*: Melvaig, Gairloch, 1897 (J. M'Lellan; in Edinburgh Museum); Strathcarron, June 1902, ♂, wings strongly suffused with saffron (from S. M. Macvicar). *E. Ross*: Kindace Moor, 26th June 1908, ♂ and ♀ (from Miss A. C. Jackson). *Outer Hebrides*: near Stornoway, Lewis, July 1874 (W. E.); Loch Boisdale, S. Uist, June 1910, Common (P. H. Grimshaw).

SOMATOCHLORA ARCTICA (Zett.).—*Mid Perth*: on 8th July 1905 I saw, but failed to capture an example of this species a few miles from Killin and practically in the same locality where Mr. Morton took a specimen some years before.

CORDULEGASTER ANNULATUS (Latr.). — *S.W. Perth*: head of Loch Lubnais, 23rd June 1906, ♀ (from W. Edgar Evans). *Mid Perth*: near Ballinluig, 1895 (T. M. M'Gregor; in Perth

Mus.); near Tummel Bridge, July 1905, common (K. J. Morton); Glen Lochay, Killin, 8th July 1905, ♂ and ♀ (W. E.). *Easternness*: near top of Craigellachie, Aviemore, June 1893, ♂ and ♀ (W. E.). *Westernness*: Invermoidart, 21st May 1901, ♀, and 27th July 1902, ♂ (from S. M. Macvicar). *Main Argyll*: Ardkinglas (J. J. F. X. King); Morvern, July 1894 and 1895, several (from C. Campbell); Loch Awe, 3rd July 1900, ♂ and ♀ (from R. Godfrey); Bridge of Awe, July 1903, ♂ (from J. W. Bowhill). *Dumbarton*: between Arrochar and Ardlui, end of July 1909, ♂ (from J. H. Ashworth); Waterworks, near Coulpport, Loch Long, 29th June 1910, ♀ (W. E.). *N. Ebudes*: Skye (T. C. Tyrie, *fide* P. H. Grimshaw); Camasunnarie Lodge, Broadford, Skye, 15th July 1908, ♀ (from Miss A. C. Jackson); Rum, 10th June 1910, ♀ (from Misses Baxter and Rintoul). *W. Ross*: Kinlochewe (King); Coulin, 1910, ♀ (from Misses Baxter and Rintoul). *E. Ross*: Swordale, 13th July 1908, ♂ (from Miss Jackson). *W. Sutherland*: Assynt, June 1904, ♂ (W. Eagle Clarke; in Edin. Mus.).

ÆSCHNA CÆRULEA, *Ström.*—*Mid Perth*: Glen Lochay, 8th July 1905, ♂ captured and another seen (W. E.). I owe the knowledge of this habitat to Mr. Morton, who gave me a specimen he took there in July 1898.

Æ. JUNCEA (L.).—*Dumfries*: Kelhead Moss, 1900, ♂ (D. W. Campbell; in Edin. Mus.); Lockerbie, Sept. 1908 (R. J. Ritchie; in Edin. Mus.); Dumfries district, common in suitable localities (B. M'Gowan, *in litt.*, 8. ix. 1910). *Kirkcudbright*: on the summit of Criffel (1900 ft.), in July 1909, Mr. G. A. Dunlop took several dead specimens floating in the pools, and saw one alive (*in litt.*, 12. xii. 1910). *Lanark*: Elvanfoot, Sept. 1900 (W. E.). *Peebles*: between West Linton and Dolphinton, 3rd Sept. 1910, two (Miss Ethel Evans). *Selkirk*: near Selkirk, August 1903 (W. E.); Galashiels, one caught in the town two or three years ago (in coll. W. Pringle, where I have seen it). *Roxburgh*: near Hawick, August 1901, ♀ (W. E.); several specimens taken a number of years ago in Elwyn Glen, etc., near Melrose, have been shown to me by W. Pringle and T. Tait. *Berwick*: Ale Water, near Eyemouth, one, Sept. 1895 (W. E.); Coldingham Moor, several records 1883, etc. (W. E.). *Haddington*: Johnscleuch on the Lammermuirs, 12th August 1910, two (W. Thomson). *Edinburgh*: ♂ taken in George Street, Edinburgh, 13th August 1909 (A. Morrison). *Stirling*: Touch and Leckie (J. Sword). *Mid Perth*: Aulich, Rannoch, August 1881 (W. E.); Methven, 1894 (J. M. M'Gregor; in Perth Mus.); Buchanty, Glenalmond, 1898 (A. M. Rodger; in Perth

Mus.); Glenfarg, 21st Sept. 1899, ♂ caught, two others seen (W. E.); Killin district, 8th July 1905, ♀ caught—common in August (W. E.). *N.E. Perth*: Falls of Bruar, near Blair Atholl, Sept. 1898 (W. E.). *Forfar*: Curling pond, Montrose, 1899, ♂, and Rossie Muir, Sept. 1910, ♂ (from W. Duncan, Montrose Mus.). *S. Aberdeen*: Newton Dee, near Aberdeen, 21st August 1907, ♀ (D. MacRitchie; in Edin. Mus.). *Elgin*: Cromdale, August 1891 (W. E.). *Easternness*: Kin-craig, near Kingussie, August 1889 (W. E.); Glen Moriston, August 1907 (from J. W. Bowhill). *Westernness*: Invermoidart, 15th October 1910, ♂ (from S. M. Macvicar). *Dumbarton*: Ardpeaton, 12th Sept. 1910, ♂ (from G. L. Deuchar). *Clyde Isles*: near Millport, Cumbrae, 1904, two (from D. Gourlay). *S. Ebudes*: Mull of Oa, Islay, 29th August 1904, two (from Miss Ethel Evans). *Mid Ebudes*: Loch Freisa, Mull, August 1905, ♂ (from J. W. Bowhill). *E. Ross*: Swordale Moor, 7th July 1908, ♂, 24th July, ♀ (from Miss A. C. Jackson). *Outer Hebrides*: Butt of Lewis, 24th July 1909, one taken on seashore (R. Clyne, *vide* P. H. Grimshaw). *Orkney*: Berridale Valley, Hoy, one obtained in July 1910 (G. Ellison, *in litt.*, 6. xii. 1910).

CALOPTERYX VIRGO (L.).—*Mid Perth*: Tyndrum, 1895 (John M'Gregor; in Perth Mus.). *Westernness*: Hill Loch (alt. 300 ft.), Moidart, 2nd July 1902, ♂ (from S. M. Macvicar). *Main Argyll*: Loch Aline, Morvern, July 1894 and 1895, 4 ♂ ♂ and 2 ♀ ♀ (from C. Campbell); Taynult, June 1903, ♂ (J. Waterston; in Edin. Mus.); Bridge of Awe, July 1903, 2 ♂ ♂ (from J. W. Bowhill). *Kintyre*: between Ardrishaig and Tayvallich, July 1910, ♂ (from Prof. Graham Kerr). *Mid Ebudes*: Lussa River, Loch Spelve, Mull, early July 1910, common (E. B. Bailey).

LESTES SPONSA (Hans.).—*Kirkcudbright*: Kirkcudbright (J. J. F. X. King). *Mid Perth*: between the Tay and the Tummel, near Ballinluig, 1898 (A. M. Rodger; in Perth Mus.); Dalreoch, near Tummel Bridge, 21st July 1905 (K. J. Morton). *S. Aberdeen*: Lumphanan, July 1910 (K. J. Morton). *Elgin*: Forres (J. J. F. X. King). *Easternness*: Aviemore, June 1893, several (W. E.); Guisachan (King). *Westernness*: Invermoidart, 14th Sept. 1900, 2 ♂ ♂ (from S. M. Macvicar). *Main Argyll*: near Oban, 17th July 1901, ♂ (from R. Godfrey); Loch Feochan, August 1904, common (from J. W. Bowhill). *E. Ross*: Strathpeffer, July 1907, 3 ♂ ♂ and 1 ♀ (from Misses Baxter and Rintoul). *W. Sutherland*: Strath Naver, 1883, very common in one place (J. J. F. X. King, *in litt.*, 13. ix. 1910).

PYRRHOSOMA NYMPHULA (*Sulz.*).—*Peebles*: West Linton district, 1872 (W. E.). *Selkirk*: Tushielaw, Ettrick, 16th June 1889, ♂ (W. E.); Cauldshiels Loch, south-east of Galashiels, summer of 1904, ♂ and ♀ ♀ (T. Tait, in whose collection I have seen them). *Berwick*: Mr. J. Ferguson (*in litt.*, 9. ix. 1910) reports "the small crimson species" from the Duns district. *Fife and Kinross*: Loch Leven (east end), June 1908, etc., several ♂ ♂ and ♀ ♀ (W. E.). *Stirling*: Reddings Moor, near Falkirk, April 1910, nymph (W. E.). *Mid Perth*: west of the Tummel, near Ballinluig, 1895 (T. M. M'Gregor; in Perth Mus.); Methven Moss, 1908 (W. Wylie; in Perth Mus.). *N.E. Perth*: Muir of Durdie, 1908 (W. Wylie; in Perth Mus.). *Elgin*: Cromdale, 1891 (W. E.). *Easternness*: Aviemore, June 1893, Common (W. E.); Glenferness, Nairn, June 1901 (from C. Campbell). *Westernness*: Kinlochailort, June 1884 (W. E.); Invermoidart, June 1902, common (from S. M. Macvicar). *Main Argyll*: Loch Aline, Morven, July 1894 (from C. Campbell); Loch Awe, ♂ (from Miss E. V. Baxter). *Clyde Isles*: D. Gourlay tells me he has seen "the small red dragonfly" near Millport, but the evidence of a specimen is needed. *N. Ebudes*: Broadford, Skye, June 1902 (from S. M. Macvicar). *W. Ross*: Kinlochewe (J. J. F. X. King); Melvaig, Gairloch, 1897, two (J. M'Lennan; in Edin. Mus.); Strathcarron, June 1902 (from S. M. Macvicar). *E. Ross*: Kindace Moor, June 1908, ♀ (from Miss Jackson). *W. Sutherland*: Assynt, June 1904, seven (W. Eagle Clarke; in Edin. Mus.). *Outer Hebrides*: near Stornoway, July 1874 (W. E.); Barra, 2nd June 1910, ♂ (from Misses Baxter and Rintoul); Loch Boisdale, South Uist, June 1910, very common (P. H. Grimshaw). *Orkney*: Grassy stream at Kringleford Hill, Kirbister, near Stromness, summer of 1910, a number (G. Ellison, *in litt.*, 6. xii. 1910).

ISCHNURA ELEGANS (*Lind.*).—*Mid Perth*: Methven Moss, 1894 (T. M. M'Gregor; in Perth Mus.). *N.E. Perth*: between Blairgowrie and Dunkeld, July 1890, ♂ (W. E.); Muirton Pond, near Blairgowrie, June 1908 (A. E. J. Carter; named by Morton). *Easternness*: Aviemore, June 1893, common (W. E.). *Westernness*: Moidart, June 1902, seven (from S. M. Macvicar); *Main Argyll*: Loch Feochan, August 1904, common (from J. W. Bowhill). *Dumbarton*: Helensburgh Moor (King). *Mid Ebudes*: Tiree, June 1900 (from J. Baxter). *W. Ross*: Loch Alsh (King). *Outer Hebrides*: Loch Boisdale, S. Uist, June 1910, common (P. H. Grimshaw). *Orkney*: Kringleford, near Stromness, 1910 (from G. Ellison).

AGRION PULCHELLUM (*Lind.*).—*Renfrew*: Mr. J. J. F. X. King informs me (*in litt.*, 9. x. 1910) that he has specimens of this

and the next species which were given to him by Mr W. Watson, "and were said to be captured at Houston, Renfrewshire." *Elgin*: Mr. King also writes me that he has a female *Ag. pulchellum*, which he took on 15th July 1904, near the Ferry Wood, Forres.

A. PUELLA (*Linn.*).—*Renfrew*: Houston (W. Watson; in Mr. King's collection as mentioned above).

ENALLAGMA CYATHIGERUM (*Charp.*).—*Kirkcudbright*: Kirkcudbright (King). *Peebles*: Macbiehill, 1872 (W. E.); Glen Pond, July 1901 (from R. S. Anderson). *Selkirk*: Tushielaw, July 1892 (W. E.); Cauldshiels Loch, south-east of Galashiels, about 1886 and 1904, several ♂♂ (Messrs. Pringle and Tait, in whose collections I have examined them). *Roxburgh*: Kelso, 29th June 1902, ♂ (from J. W. Bowhill). *Berwick*: Coldingham Loch, June 1887 (W. E.).¹ *Haddington*: coast south of Dunbar where Broxmouth Burn enters the sea, 27th June 1908, ♂ (W. E.). *Fife and Kinross*: Gilston, near Colinsburgh, two ♂♂ without date (from Miss Baxter). *Stirling*: Dunipace, June 1910, four ♂♂ (from J. M'Naughton). *Mid Perth*: Methven Moss, 1894 (T. M. M'Gregor; in Perth Mus.); west of the Tummel, near Ballinluig, 1895 and 1898 (Messrs. M'Gregor and Rodger; in Perth Mus.); near Killin, 8th July 1905, several (W. E.). *N.E. Perth*: between Blairgowrie and Dunkeld, July 1890 (W. E.); near Blairgowrie, 23rd June 1910, ♀ (from A. E. J. Carter). *Easternness*: Kincaig, August 1889, and Aviemore, June 1893, common (W. E.); Glenferness, Nairn, July 1901 (from C. Campbell). *Westernness*: Moidart, 2nd July 1902, a number of both sexes (from S. M. Macvicar). *Clyde Isles*: near Millport, June 1904, five (from D. Gourlay); three nymph skins sent from Millport by Mr. R. Elmhirst are, I believe, of this species. *Mid Ebudes*: Tiree, June 1900 (from J. Baxter). *E. Ross*: Strathpeffer, July 1907, two ♂♂ (from Misses Baxter and Rintoul); Kindace Moor, June 1908, ♂ and ♀ (from Miss Jackson). *W. Sutherland*: Assynt, June 1904, a number of both sexes (W. E. Clarke; in Edin. Mus.). *Orkney*: Loons, and Kringelford Hill, Kirbister, near Stromness, a number (G. Ellison, Liverpool, who has sent a ♂ from the former locality, dated August 1909, for identification).

Some clear statement showing the extent of our present knowledge of the distribution of the Scottish Odonata seems desirable. I have therefore drawn up the following Table,

¹ The small blue dragonflies recorded from Coldingham Loch in June 1895, by Dr. Hardy, under the name of *Agrion puella* (*Proc. Berw. N.C.* xv. p. 221) were no doubt the present species.

presenting the recorded distribution of each species by means of the Watsonian scheme of counties and vice-counties. In its preparation no very exhaustive search for records has been made, but it is believed that none of any importance are likely to have escaped notice. Besides Lucas's book on "British Dragonflies (Odonata)," published in 1900, his 'Scottish Dragonfly Records' in the July 1910 number of this Magazine, Buchanan White's Colvend list previously mentioned, my 'Odonata (Dragonflies) of the Forth Area' in the "Proceedings of the Royal Physical Society" for 1905, and the records in the foregoing pages, the following papers and notes have been laid under contribution :¹

'List of Lepidoptera and other Insects of "Dee"': by Prof. J. W. H. Trail ("Trans. N. H. Soc., Aberdeen, 1878"). Records (p. 45) seven Dragonflies from localities in N. Aberdeen, S. Aberdeen, and Kincardine. A *Calopteryx* from Fyvie is recorded as *C. splendens*, but I cannot help thinking it must have been *virgo*,² which in Scotland has a tendency to be more or less hyaline at the base and tip of the wings in the male. Unfortunately Prof. Trail has not preserved a specimen. In answer to my inquiries he writes: "I am fairly confident I saw the *Calopteryx*, but it is now many years ago, and I would not venture to regard the entry as certain, though I have always acted on the rule of excluding when in doubt" (*in litt.*, 11. viii. 1910). We must, I fear, await further evidence of the occurrence of *C. splendens* in Scotland before admitting it to our list.

'*Æschna carulea*, Ström., a Boreal Dragonfly': by K. J. Morton ("Ann. Scot. Nat. Hist.," 1899, p. 26).

'Neuroptera and Trichoptera observed in Wigtownshire during July 1899': by K. J. Morton ("Ent. Mo. Mag.," xxxv. 278-281, 1899). Eight Dragonflies enumerated from Monreith, including the form *prænumila* of *Libellula quadrimaculata*, and a very red *Sympetrum* which Mr. Morton tells me he has now no doubt was *S. striolatum*.

'Dragonflies in Inverness-shire and Sutherlandshire': by R. M'Lachlan ("E.M.M.," xxxvi. 241, 1900). Enumerates eight species including *Agrion hastulatum* from Aviemore, collected by Col. Yerbury during the summer of 1900.

¹ Papers mentioned by Mr. Lucas are not here cited. In his paper of July last, Tayrallich should be Tayvallich, in Kintyre.

² In MacGillivray's "Nat. Hist. of Deeside," 1855, *C. virgo* is included in a list of the insects of the north-east of Scotland.

'An Extraordinary Melanic Variety or Aberration of *Enallagma cyathigerum*, Chp., ♂': by R. M'Lachlan (*ibid.* p. 110). Describes and figures a specimen taken by Morton in Glen Lochay, Mid Perth, July 1898.

'Order Odonata' of the Clyde Area: by J. J. F. X. King ("British Association Handbook of the Nat. Hist. of the District," 1901, p. 313). Eight species recorded, including *Sympetrum sanguineum*. Seeing that Mr. King, as he informs me, did not see the *Sympetrum* specimen, but merely accepted the record from a local correspondent, I do not think it can be admitted. Probably the insect was only a very red *striolatum*.

'A Contribution to the Entomology of Aberdeen': by J. Mearns ("Ann. Scot. Nat. Hist.," 1901, Odonata, 213). Records nine species, determined by M'Lachlan, from localities in S. Aberdeen and Kincardine (Banchory and Invercannie Moor).

'Dragonflies in Argyll,' 1900 and 1901: by R. Godfrey (*ibid.* p. 240). Records eight species, all but one identified by W. E., from Main Argyll (Loch Awe and Oban district).

'Butterflies and Dragonflies in Banffshire,' July 1903: by H. H. Brown (*ibid.*, 1903, p. 247). Records four Dragonflies, determined by Grimshaw.

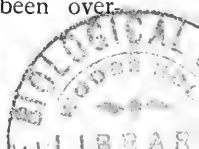
'Neuroptera and Trichoptera from Colvend,' Aug. 1902: by K. J. Morton ("E.M.M.," xxxix. 100, 1903). Three Dragonflies are mentioned.

'Neuroptera from North Uist': by K. J. Morton (*ibid.* xlii 162, 1906). Records three species of Odonata collected by J. Waterston in June 1905.

'Butterflies and Neuroptera in Perthshire' in July 1907: by K. J. Morton (*ibid.* xlv. 150, 1908). Records three Odonata from the Blair Atholl district (east of the Garry, Mr. Morton tells me, and therefore in v.c. 89), and six from Rannoch (v.c. 88).

'Methven Moss as a Collecting Ground for Entomology': by W. Wylie ("Trans. Perthsh. Soc. N. Sc.," v. pt. 1, 1909). Mentions (p. 5) five Dragonflies; one is *Orthetrum cærulescens*, which may have been correctly determined, but unfortunately Mr. Wylie, as he informs me, has not preserved a specimen.

G. Don's old list in Headrick's "Agriculture of Angus or Forfarshire," 1813, has also been consulted, and Harcourt Bath's little "Handbook of British Dragonflies," 1890, has not been over-looked.



SCOTTISH DRAGONFLIES: TABLE SHOWING RECORDED DISTRIBUTION.

Name of species.	72. Dumfries.	73. Kirkcudbright.	74. Wigtown.	75. Ayr.	76. Renfrew.	77. Lanark.	78. Peebles.	79. Selkirk.	80. Roxburgh.	81. Berwick.	82. Haddington.	83. Edinburgh.	84. Linlithgow.	85. Fife and Kinross.	86. Stirling.	87. S. W. Perth and Clackmannan.	88. Mid Perth.	89. N. E. Perth.	90. Forfar.	91. Kincardine.	92. S. Aberdeen.	93. N. Aberdeen.	94. Banff.	95. Elgin.	96. Easternness.	97. Westernness.	98. Main Argyll.	99. Dumbarton.	100. Clyde Isles.	101. Kintyre.	102. Ebudes (Inner Hebrides) S.	103. Mid Ebudes.	104. Ebudes N.	105. W. Ross.	106. E. Ross.	107. E. Sutherland.	108. W. Sutherland.	109. Caithness.	110. Outer Hebrides.	111. Orkneys.	112. Shetlands.			
<i>Leucorrhinia dubia</i> .	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	?	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
<i>Sympetrum striolatum</i> .	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>S. scoticum</i> .	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Libellula quadrimaculata</i> .	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Orithidium ceruleum</i> .	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Somatoclora metallica</i> .	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>S. arctica</i> .	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Æschia cerulea</i> .	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Æ. juncea</i> .	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Æ. grandis</i> .	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Calopteryx virgo</i> .	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Lestes sponsa</i> .	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Pyrrhosoma nymphula</i> .	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Ischnura elegans</i> .	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Agriion pulchellum</i> .	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>A. puella</i> .	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>A. hasulatum</i> .	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Enallagma cyathigerum</i> .	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

When the only record for a county is very old (prior to middle of last century) the letters o. r. are inserted in place of a cross.

A query in place of a cross indicates that there is a more or less recent record but that some uncertainty attaches to it.

De Selgys, writing in 1850, refers to *Cordulegaster annulatus* as occurring "near Edinburgh," but from his 1840 paper it does not appear that he had seen a specimen from nearer than Loch Katrine.

It will be seen that I recognise the claims of nineteen species to be included in the Scottish fauna. The least satisfactory is *Æschna grandis*. The announcement in Mr. Lucas's recent paper that it had been taken at Ellangowan, Dumfries, by Mr. B. M'Gowan was, unfortunately, an error, owing, it appears, to Mr. M'Gowan having inadvertently written *grandis* for *juncea* in a letter to Mr. Lucas. Mr. M'Gowan assures me he has never seen *grandis* in Scotland.

There is no need to go over the Table in detail; it speaks for itself, and shows at a glance how many counties each species has been recorded from, and how many species have been recorded from each county. In the former enumeration, *Æschna juncea* heads the list, appearing in 35 of the 41 counties, the next in order being *Enallagma cyathigerum*, *Pyrrosoma nymphula*, and *Sympetrum scoticum*, with 32, 31, and 30 respectively to their credit. The most productive counties, taken as a whole, are Inverness with 15 of the 19 species, and Perth with 13 or 14, both yielding the two boreal species, *Somatochlora arctica* and *Æschna carulea*. Six species are recorded from the Outer Hebrides, four from Orkney, but only one so far—the common *E. cyathigerum*—from Shetland. The poorest section of the mainland of Scotland, as regards Odonata, is that which lies to the south-east of the "Highland line"; in the south-west corner, adjoining the Solway, there is an improvement. Dragonflies are naturally more at home in a natural country well supplied with suitable aquatic habitats, such as one finds in the Highlands and along the West Coast.

In conclusion, I would point to the blanks in the Table, and solicit the help of readers of the "Annals" in an endeavour to fill them up, as far as possible, in the coming summer.

NOTE ON VARIATION IN THE JELLY-FISH *AURELIA AURITA*.

By D. C. M'INTOSH, M.A., B.Sc., F.R.S.E.

WHILE variation has for some time been recognised as a fact of fundamental importance in evolution, it is only within

recent years that it has come to be looked upon as a "measurable" quantity. Scientists, no longer content with vague statements as to certain variations being occasionally or frequently met with in a species, now demand a definite assertion as to the extent of the variation in a particular character as well as the exact percentage of cases in which it occurs. Although it may very readily be admitted that at present it is not possible either to explain the causes or to interpret fully the facts of variation, it is believed that a record of the extent of variation in certain organs of an individual is an aid to biological study. The field to be examined is inexhaustible, for it is the world of organised life. What is required in the meantime is an ample collection of data bearing on variation ; interpretation would not then be long delayed.

The following is a very brief account of some variations observed in the common jelly-fish, *Aurelia aurita* (Linn.). This animal is familiar to all visitors to the sea-side during the summer and autumn months, owing to the frequency with which it is found stranded on the shore. In the quiet bays round our coasts, shoals of this jelly-fish are often seen swimming near the surface of the water or drifting gently with the tide. There is nothing fish-like either in the saucer-shaped appearance of a jelly-fish or in the characteristic pulsating movements by means of which it propels itself through the water. In the months of August and September 1908, Mr. R. Elmhirst of the Millport Marine Station collected for me 281 specimens of *Aurelia aurita*, partly from Loch Ridden and partly from Kilchattan Bay, in the Firth of Clyde. They were placed as soon as captured in a 5 per cent formalin solution, and so successfully were they preserved that, though not examined for many months, only a few specimens were so damaged that they had to be rejected. As the time of year of capture indicates, these examples were all well-grown mature adults. They were examined for the purpose of comparing such variation as they showed in certain organs with the variation I had already found¹ in

¹ D. C. McIntosh, 'Variation in *Aurelia aurita*,' "Proc. Roy. Phy. Soc. Edinburgh, 1910," vol. xviii. pp. 125-143.

1000 small adults (just past the ephyra stage) taken from the Clyde some years previously.

(1) *On the number of Branched Radial Canals and Tentaculocysts.*

A normal example of *Aurelia aurita* has eight branched canals stretching from the central stomach to the ring canal round the margin of the umbrella. Four of these, the perradial canals, lie between the gonads, and the other four, the interradial canals, are placed opposite to the gonads. At the outer end of each of the branched canals there is a single tentaculocyst or sense-organ. As there is perfect correlation between the number of branched radial canals and the number of tentaculocysts, except in the case of twin-tentaculocysts, in the following table the figures which stand for the number of canals represent at the same time the number of tentaculocysts.

Number of specimens.		Branched radial canals.	Number of specimens.		Branched radial canals.
2	with	6	8	with	12
1	"	7	1	"	13
238	"	8 (normal)	3	"	14
10	"	9	0	"	15
13	"	10	1	"	16
4	"	11			

Examination of these figures shows 43 or 15.3 per cent of these 281 specimens of *Aurelia aurita* had either more or less than the normal eight branched canals and eight tentaculocysts. This percentage, while less than what Browne¹ found among *Aurelias* from near Plymouth, is quite in accordance with the percentage of abnormal forms I had previously observed among small adults from the Clyde (*l.c.* p. 131). It will be noted that the range of variation is from 6 to 16 tentaculocysts and branched radial canals, and that where departure from the normal occurs the numbers tend to be higher. What is especially worthy of remark is that there is not, as might be expected, a regularly decreas-

¹ E. T. Browne, 'Variation in *Aurelia aurita*,' "Biometrika," vol. i. pp. 90-108.

ing series of abnormal forms. We find, instead, two regularly decreasing series, one for individuals with 10, 12, 14, 16, and another for individuals with 9, 11, 13, 15 branched radial canals and tentaculocysts. The table given also shows that there are 25 individuals with 284 branched radial canals and tentaculocysts in the former series, against 15 individuals with 147 branched radial canals and tentaculocysts in the latter. Looking at these facts in another way we observe that the abnormal examples have an average of 10.5 branched radial canals. Though the details of the branched canal system are not given here, they show that it is in the "perradial" system (*i.e.* between the gonads) that the increase in the number of canals is greatest.

Occasionally there are found individuals with twin-tentaculocysts, covered by a small marginal hood, at the end of a single canal. In this collection there were found two examples with this abnormality, and in both cases the twin-tentaculocysts were situated perradially. In one of the individuals this "twinning" was the only abnormality noted; in the other there were five gonads, ten branched canals, and eleven tentaculocysts.

(2) *On the number of Gonads and Oral Lobes.*

A normal *A. aurita* has four symmetrically situated genital sacs each with a horse-shoe-shaped gonad, and four oral lobes. The gonads, becoming highly coloured as they ripen, are very characteristic and conspicuous organs. In all the examples I have examined there is perfect correlation between the number of gonads and the number of oral lobes. The following is a summary of the observations made:

2 specimens had 3 gonads and 3 oral lobes.						
269	"	"	4	"	"	4
4	"	"	5	"	"	5
3	"	"	6	"	"	6
2	"	"	7	"	"	7
1	"	"	8	"	"	8

From this it is seen that the range of variation for gonads and for oral lobes is from 3 to 8. The solitary individual with 8 gonads measured only 7 centimetres in

diameter. It had 16 tentaculocysts, 8 perradial and 8 inter-radial canals. It will be observed that 12 individuals or 4.3 per cent had an abnormal number of gonads, and that where departure from the normal occurs the numbers tend to be higher. This percentage is high when compared with percentages which I have previously noted (*l.c.* p. 133), and by way of explanation it is suggested (1) that too few individuals are considered in this case, and (2) that there is great difficulty in collecting nearly three hundred individuals as they drift past a small boat without selecting, it may be unconsciously, the very specimens whose gonads are seen to be abnormal in number.

Other details were noted, but since in connection with them there is more likelihood that error may arise from insufficiency of specimens and unconscious selection in collecting, it is not proposed to discuss them. The main purpose I have is rather to direct the attention of readers of the "Annals" to an aspect of biology in which some of them, having peculiar facilities, might be able to supply useful statistics.

ZOOLOGICAL LABORATORY,
UNIVERSITY OF EDINBURGH.

CONTRIBUTION TO OUR KNOWLEDGE OF THE HYDROID FAUNA OF THE WEST OF SCOT- LAND.

BEING AN ACCOUNT OF COLLECTIONS MADE
BY SIR JOHN MURRAY, K.C.B., ON S.Y. "MEDUSA."

By JAMES RITCHIE, M.A., B.Sc.,
The Royal Scottish Museum.

(Continued from p. 225, No. 76, October 1910.)

CALYPTOBLASTEÆ.

Family HALECIDÆ.

15. HALECIUM BEANII, Johnston.

CLYDE SEA AREA.—DUNOON BASIN (M.)—20-40 fms.; E. side,
5-10 fms., r. BARRIER PLATEAU—Sanda to Achinloan, 22 fms.,

r. ; Sound of Sanda, 22 fms., on *Thuiaria lonchitis* ; between Sanda Is. and Ailsa Craig, 24 fms.

MULL OF CANTYRE, 50 fms.

16. *HALECIUM HAECINUM* (Linn.).

CLYDE SEA AREA.—LOCH GOIL (M.)—head to Stuckbeg, r. ; E. side from below Pier, 30-35 fms., r. DUNOON BASIN (M.)—E. side, 42 fms., r. LOCH STRIVEN, (M.)—W. side, 20-35 fms., r. ARRAN BASIN—Kilbrennan Sound, 10-15 fms. ; off Pladda, 30-35 fms., r. (M.). BARRIER PLATEAU—Sanda to Achinloan, 19-22 fms., m.c. (M.) ; between Sanda Is. and Ailsa Craig, 24 fms.

SANDA IS., 35 fms., on *Thuiaria lonchitis*.

MULL OF CANTYRE, 49 fms.

FIRTH OF LORNE, 70-80 fms. (M.).

17. *HALECIUM LABROSUM*, Alder.

MULL OF CANTYRE, 49-50 fms.

FIRTH OF LORNE, 30-110 fms.

18. *HALECIUM MURICATUM* (Ell. and Sol.).

CLYDE SEA AREA (M.).—UPPER LOCH FYNE—Minard Narrows, 15-20 fms., r.r. BARRIER PLATEAU—Sanda to Achinloan, 19-22 fms., r.

MULL OF CANTYRE, 50 fms.

FIRTH OF LORNE, 70-80 fms.

19. *HALECIUM TENELLUM*, Hincks.

In two cases a gonangium was observed to arise from *within* instead of from *below* a hydrotheca. The perisarc of many of the specimens was much wrinkled.

MULL OF CANTYRE, 50 fms., on *Halecium muricatum*.

FIRTH OF LORNE, four records at depths between 30-110 fms., on *Halecium labrosum* and *Diphasia pinaster*.

Family CAMPANULARIDÆ.

20. *CLYTIA JOHNSTONI* (Alder).

CLYDE SEA AREA.—BARRIER PLATEAU—between Sanda Is. and Ailsa Craig, 24 fms., with rounded teeth, on *Halecium beanii* and seaweed.

SANDA IS., 35 fms., on *Thuiaria lonchitis*.

FIRTH OF LORNE, 50-110 fms., not c. on *Schizotricta frutescens* ; 70-80 fms., great variation in depth of cups.

LOCH ETIVE, 70 fms., on *Hydrallmania falcata*.

LOCH BUY, 9-15 fms., on *Sertularella gayi*.

21. THAUMANTIAS INCONSPICUA, Forbes.
(CAMPANULARIA RARIDENTATA, Alder.)

The specimens from all the localities, except the last mentioned, differed from Hincks's examples in having their stems wholly ornamented with rings which varied in definiteness in different specimens.

CLYDE SEA AREA.—SOUND OF SANDA, 22 fms., r.r., on *Thuiaria lonchitis*.

FIRTH OF LORNE, 30-110 fms., on Spider-crab; 50-70 fms.

LOCH BUY, 9-15 fms., on *Sertularella gayi*.

BETWEEN CANNA AND RUM, on *Diphasia pinaster*.

22. OBELIA DICHOTOMA (Linn.).

CLYDE SEA AREA—off Cumbræ Is., 15 fms. (M.).

23. OBELIA GENICULATA (Linn.).

CLYDE SEA AREA.—LOCH LONG, low water (M.). LOCH STRIVEN, low water (M.). ARRAN BASIN—Kilbrennan Sound, 10-15 fms., on *Thecocarpus myriophyllum*.

24. OBELIA LONGISSIMA (Pallas).

CLYDE SEA AREA.—BARRIER PLATEAU—between Sanda Is. and Ailsa Craig, 24 fms.

FIRTH OF LORNE, 30-50 fms.

25. GONOTHYRÆA GRACILIS (Sars).

FIRTH OF LORNE, 60-80 fms., 4 rings below hydrotheca, instead of 2.

26. GONOTHYRÆA HYALINA, Hincks.

Nutting observed on clumps of *G. hyalina* and *G. loveni*, obtained near Plymouth, specimens which showed complete intergradation between what he regarded as almost typical forms of the two species; and he has recorded his opinion that "there is a strong probability that these two so-called species are but varieties of one form, which should bear the name of *G. loveni*, Allman."¹ I have kept the two forms separate, however, awaiting further evidence of their specific identity.

¹ Nutting, "Nat. Hist. Bull." S.U.I., vol. iv., 1896, p. 3. Reprinted from "Journ. Mar. Biol. Ass." vol. iv., 1896, pp. 146-154.

CLYDE SEA AREA.—DUNOON BASIN (M.), 20-40 fms. ; W. side, 15 fms.

FIRTH OF LORNE, two records from between 30 and 110 fms., on *Tubularia indivisa*.

27. GONOTHYRÆA LOVENI, Allman.

CLYDE SEA AREA.—GARELOCH (M.)—near Narrows, 14 fms., c. ; E. side above Narrows, 14 fms., on *Laminaria*.

28. CAMPANULARIA ANGULATA, Hincks.

CLYDE SEA AREA (M.).—LOCH GOIL—head to Stuckbeg, r. ; E. side from below Pier, 30-35 fms., r. DUNOON BASIN—centre, 20 fms., r. LOCH STRIVEN—W. side, 15-20 fms., r.

29. CAMPANULARIA FLEXUOSA, Hincks.

CLYDE SEA AREA.—BARRIER PLATEAU—Sound of Sanda, 22 fms. ; between Sanda Is. and Ailsa Craig, 24 fms., r.

FIRTH OF LORNE, 50 fms. ; 60-70 fms. on *Diphasia alata*.

30. CAMPANULARIA HINCKSI, Alder.

CLYDE SEA AREA.—ARRAN BASIN—Kilbrennan Sound, 10-15 fms., on *Lafoëa dumosa*. BARRIER PLATEAU—Sound of Sanda, 22 fms., on *Thuiaria lonchitis* ; between Sanda Is. and Ailsa Craig, 24 fms., on *Hydrallmania falcata*.

SANDA IS., 35 fms., on *Thuiaria lonchitis*.

MULL OF CANTYRE, 64 fms.

SOUND OF JURA, 17-25 fms., on *Campanularia verticillata*.

FIRTH OF LORNE, 30-50 fms., on *Antennularia ramosa* ; 30-110 fms., on *Aglaophenia tubulifera* ; 70-80 fms., on *Thuiaria cupressina*.

31. CAMPANULARIA VERTICILLATA (Linn.).

CLYDE SEA AREA.—UPPER LOCH FYNE (M.). ARRAN BASIN (M.)—Kilbrennan Sound, 28 fms. ; Farland Pt., Cumbræ, 20 fms., c.c. BARRIER PLATEAU—off Achinchoan Head, 22 fms. (M.) ; Sound of Sanda, 22 fms.

SOUND OF JURA, 17-25 fms.

32. CAMPANULARIA VOLUBILIS (Linn.).

CLYDE SEA AREA.—LOCH GOIL (M.)—head to Stuckbeg, m.c. ; E. side from below Pier, 30-35 fms., m.c. BARRIER PLATEAU, between Sanda Is. and Ailsa Craig, 24 fms., r.

BETWEEN CANNA AND RUM, 60-100 fms. (M.).

33. *HEBELLA POCILLUM* (Hincks) (= *Lafoëa pocillum* of Hincks's "History").

CLYDE SEA AREA.—GARELOCH, 20 fms., on *Abietinaria abietina* (M.).

34. *HEBELLA PYGMÆA* (Hincks) (= *Lafoëa pygmæa* of Hincks's "History").

CLYDE SEA AREA.—GARELOCH—head to Stroul, on *Thuiaria argentea* (M.).

Family LAFOËIDÆ.

35. *LAFOËA DUMOSA* (Fleming).

CLYDE SEA AREA.—LOCH GOIL (M.)—head to Stuckbeg; E. side from below Pier, 30-35 fms.; above Barrier, 25 fms.; across Barrier, 7-12 fms., m.r. DUNOON BASIN (M.), 20-40 fms.; E. side, 16-20 fms., m.c.; centre, 10-50 fms., m.c. LOCH STRIVEN (M.), centre from head of loch, 15-20 fms., r.; W. side, 20-30 fms., on *Tubularia indivisa*, r. KYLES OF BUTE—off Tighnabruaich. UPPER LOCH FYNE (M.)—Minnard Narrows, 12-20 fms., r.; E. side, 15-20 fms., r. ARRAN BASIN—Kilbrennan Sound, 10-15 fms.; below Isle of Ross, 12-14 fms., stones, r.; Otterard to Carradale, 18-20 fms., r.; centre, off Saddell, 47 fms., r.; off Pladda, 30-35 fms., r.; Farland Point, Cumbræ, 20 fms., c. BARRIER PLATEAU—between Achinloan Head and Davarr Is., 17-20 fms., sand, on *Antennularia ramosa* (M.); between Sanda Is. and Ailsa Craig, 24 fms., r., on *Halecium beanii*.

SANDA ISLAND, 35 fms., c., on *Thuiaria lonchitis*.

MULL OF CANTYRE, 49 fms., on *Plumularia pinnata* and *Halecium labrosum*.

FIRTH OF LORNE—the creeping form was found at 50-110 fms., not c., on *Schizotricha frutescens*; 70-80 fms., on *Halecium muricatum* and *Diphasia pinaster*. The form *robusta*, at 30-110 fms., on Spider-crab and *Aglaophenia tubulifera*; 30-50 fms., on *Diphasia pinaster*; 50 fms., on *Schizotricha frutescens*; 60-70 fms., on *Diphasia alata*, etc.

SOUND OF SLEAT—between Loch Arisaig and Plockton, 8-24 fms.

36. *LAFOËA GRACILLIMA* (Alder) (= *L. fruticosa* of Hincks's "History").

CLYDE SEA AREA (M.).—GARELOCH—Narrows, 3 fms., c. LOCH GOIL—shore, low water, r.; head of Loch to Stuckbeg, m.c.; E. side below Pier, 30-35 fms., m.c. DUNOON BASIN, 20-40 fms.; E. side, 42 fms., r.; W. side, 6-8 fms., r.; centre, 10-40 fms., m.c. LOCH STRIVEN—E. side, 15 fms., r.; centre 15-20 fms., r.r. UPPER LOCH FYNE—Minard Narrows, 12-20 fms.,

r. ARRAN BASIN—Kilbrennan Sound, off Davarr Is., 20 fms., r.r. ; Otterard to Carradale, 18-20 fms., m.c. ; off Saddell, 47 fms., m.r.

FIRTH OF LORNE, 50 fms.

SOUND OF SLEAT—between Loch Arisaig and Plockton, 8-24 fms.

37. FILELLUM SERPENS (Hassall).

CLYDE SEA AREA.—BARRIER PLATEAU—between Sanda Is. and Ailsa Craig, 24 fms., on *Hydrallmania falcata*.

SANDA ISLAND, 35 fms., on *Thuiaria lonchitis*.

FIRTH OF LORNE, 30-50 fms., on *Antennularia ramosa* and *Abietinaria abietina*; 50-110 fms., not c. on *Schizotricha frutescens*; 60-70 fms., on *Abietinaria abietina* and *Diphasia alata*; 70-80 fms., on *Sertularella tenella* and *Tubularia indivisa*.

SOUND OF MULL, 70 fms., on *Abietinaria abietina*.

(To be continued.)

SOME ARGYLL AND PERTHSHIRE FUNGI.

By HAROLD J. WHELDON.

TOWARDS the end of July last, Messrs. Albert Wilson, F.L.S., and J. A. Wheldon, F.L.S., paid a short visit to Rannoch Moor and the neighbouring districts, with the object of investigating the lichen flora. At my request they collected some fungi, a list of which appears below.

It will be evident that this list does not by any means adequately represent the fungi which occur in the rich districts visited, even at this early date, and probably it would have been much more exhaustive if the weather conditions had been better, and if the attention of the collectors had been devoted solely to this group of plants.

The extensive woods on the shore of Loch Rannoch were explored scarcely at all, owing to lack of time and incessant rain; and for the same reasons minute fungi and Myxomycetes were not searched for.

Additional interest is added to the records as the collectors took careful observations of the altitudes at which many of the specimens were gathered, and these are quoted. The numbers placed before the localities refer to the

Watsonian vice-comital divisions, viz. Mid Perth (V.C. 88), in the East Highlands Province, and Argyll (V.C. 98), in the West Highlands Province.

AGARICINÆ.

- ARMILLARIA MELLEA (*Vahl.*), *Fr.* 88, stump near Loch Rannoch.
 COLLYBIA CLAVUS (*Linn.*), *Fr.* 98, on branches, Ben-an-Dothaidh.
 C. DRYOPHILA (*Bull.*), *Fr.* 88, south side of Loch Rannoch.
 MYCENA RUGOSA, *Fr.* 98, Ben Douran, on old stumps at 1100 ft.
 M. POLYGRAMMA (*Bull.*), *Fr.* 88, near Loch Rannoch.
 M. GALOPODA (*Pers.*), *Fr.* 98, Ben Douran.
 OMPHALIA SPHAGNICOLA, *Berk.* 88, Crianlarich, and on Ben Chalum, at 2300 ft. among Sphagnum.
 O. FIBULA (*Bull.*), *Fr.* 88, Ben Chalum among moss, at 2000 ft. ; 98, Ben-an-Dothaidh at 3000 ft.
 O. UMBELLIFERA (*Linn.*), *Fr.* 88, Ben Chalum, 2900 ft. ; 98, Ben-an-Dothaidh at 2800 ft.
 LACTARIUS RUFUS (*Scop.*), *Fr.* 88, pine wood near Loch Rannoch.
 L. TURPIS (*Weinm.*), *Fr.* 88, woods south of Loch Rannoch.
 L. GLYCIOSMUS, *Fr.* 88, with the preceding.
 L. QUIETUS, *Fr.* 88, Kinloch Woods, north of Loch Rannoch.
 RUSSULA DECOLORANS, *Fr.* 88, woods south of Loch Rannoch.
 R. OCHRACEA (*Pers.*), *Fr.* 88, Kinloch Woods.
 R. EMETICA, *Fr.* 88, woods south of Loch Rannoch.
 R. HETEROPHYLLA, *Fr.* 88, with the preceding.
 CANTHARELLUS CIBARIUS, *Fr.* 88, pine woods, Loch Rannoch.
 MARASMIUS OREADES (*Bolton*), *Fr.* 88, Kinloch.
 M. ANDROSACEUS (*Linn.*), *Fr.* 88, Ben Chalum at 2900 ft. ; on dead stems of heather, etc.
 M. RAMEALIS (*Bull.*), *Fr.* 88, Kinloch Woods, on twigs.
 PLUTEUS CERVINUS (*Schæff.*), *Fr.* 98, Ben Douran, at 1100 ft.
 PHOLIOTA EREBIA, *Fr.* 98, Ben-an-Dothaidh, at 2100 ft.
 P. TOGULARIS (*Bull.*), *Fr.* 88, near Loch Rannoch.
 P. MYCENOIDES, *Fr.* 88, Ben Chalum, at 2900 ft.
 HEBELOMA MESOPHÆUM, *Fr.* 88, pine wood, Loch Rannoch.
 H. CRUSTULINIFORME (*Bull.*), *Fr.*, with the preceding.
 GALERA HYPNORUM (*Batsch.*), *Fr.* 88, Crianlarich, at 500 ft., among moss.
 PAXILLUS INVOLUTUS (*Batsch.*), *Fr.* 88, pine wood, Loch Rannoch.
 STROPHARIA MERDARIA, *Fr.* 88, Crianlarich, at 500 ft.

- S. SEMIGLOBATA. 88, Crianlarich, and on Ben Chalum; 98, Ben Douran.
- HYPHOLOMA FASCICULARE (*Hudson.*), *Fr.* 88, Kinloch Woods; 98, Ben-an-Dothaidh, on stumps.
- PSILOCYBE SEMILANCEATA, *Fr.* 88, Crianlarich, at 600 ft.
- PSATHYRA CONOPILEA, *Fr.* 88, Crianlarich, at 600 ft.
- P. SEMIVESTITA, *B.* and *Br.* 88, Ben Chalum.
- COPRINUS MICACEUS (*Bull.*), *Fr.* 88, Kinloch.
- C. PLICATILIS (*Curt.*), *Fr.* 88, Crianlarich, at 600 ft.
- C. RADIATUS (*Bolton*), *Pers.* 88, Crianlarich, on cow-dung.
- PANÆOLUS PHALÆNARUM (*Bull.*), *Fr.* 88, near Crianlarich, at 600 ft.; 98, Ben-an-Dothaidh, at 2100 ft.
- P. PAPILIONACEUS (*Bull.*), *Fr.* 88, with the preceding; 98, Ben-an-Dothaidh, at 2000 ft.

POLYPOREÆ.

- BOLETUS SCABER (*Bull.*). 88, south side of Loch Rannoch.
- B. DURIUSCULUS (*Schultz*). 88, Kinloch Woods.
- B. SUBTOMENTOSUS (*Linn.*). 88, with the preceding.
- POLYPORUS SCHWEINITZII, *Fr.* 88, plentiful in the pine wood south of Loch Rannoch.
- POLYSTICTUS VERSICOLOR (*Linn.*), *Fr.* 88, Allt Inverhaggernie, near Crianlarich.

HYDNEÆ.

- GRANDINIA GRANULOSA (*Pers.*), *Fr.* 88, Allt Inverhaggernie; 98, Ben-an-Dothaidh and Ben Douran, 1100 ft.

THELEPHOREÆ.

- STEREUM PURPUREUM (*Pers.*). 88, pine wood, Loch Rannoch.
- S. HIRSUTUM (*Willd.*), *Fr.* 88, Kinloch.

CLAVARIEÆ.

- CLAVARIA VERMICULARIS (*Scop.*). 88, Kinloch.
- CALOCERA VISCOSA (*Pers.*), *Fr.* 88, pine wood south of Loch Rannoch.

TREMELLINÆ.

- DACRYOMYCES STILLATUS (*Nees*). 98, on stumps of birch and pine, exposed in the bog on Ben Douran at 1100 ft.

UREDINACEÆ.

MELAMPSORA ARCTICA, Rost. 98, on leaves of *Salix herbacea*, Ben-an-Dothaidh, at 3100 ft.

Specimens of the *Salix* were brought home for cultivation at Walton, near Liverpool, and it was observed to be infected by a *Lecythæa*, on the under sides of the leaves only. After the fall of the leaves, they were left on the soil to see if the teleutospores would develop. Two only of the rufus-black sori were obtained. As the two species of *Melampsora* commonly found on the larger willows do not appear to have been recorded as occurring on *S. herbacea*, it was thought that our specimens might prove to be one of the more boreal species, *M. arctica*, Rost., and *M. alpina*, Juel. Through the kindness of Professor Warming, F.L.S., of Copenhagen University, we obtained from Mr. Jens Lind information regarding these two species, which enabled us to determine our plant to be *M. arctica*. We are not aware that this alpine fungus has been previously recorded as British, but it occurs in Greenland on *Salix grænlandica*, *S. glauca*, *S. herbacea*, and *S. arctica*, in Norway on *S. glauca*, *S. nigricans*, and *S. herbacea*, and in the Tyrol on *S. retusa*.

M. alpina should be sought for in Scotland, as two of its hosts, *Saxifraga oppositifolia* and *Salix herbacea*, not infrequently grow in propinquity. In this species the uredospores are usually epiphyllous and the teleutospores amphigenous. Both stages are hypophyllous in *M. arctica*.

PYRENOAMYCETES.

HYPOMYCES CHRYSOSPERMUS (Fckl.). 88, Wood near Loch Rannoch in the conidial condition, *Sepedonium chrysospermum*).

XYLARIA HYPOXYLON, L. 88, north side of Loch Rannoch.

LINOSPORA CAPRÆ (D.C.), Fck. 98, on leaves of *Salix herbacea*, on Ben-an-Dothaidh, at 3100 ft. This fungus developed in November on the fallen leaves of the *Salix* under cultivation, referred to under *Melampsora*. As the *Salix* was grown under glass and no other species of the genus was grown in the house, it is presumed that these plants were already infected when gathered. *L. arctica* is said to occur on the leaves of *Salix reticulata*; and as *S. herbacea* is a similar small boreal species it was thought that the *Linospora* would be *L. arctica* rather than *L. Capræ*, which usually occurs on the more arboreal Salices of less alpine localities. The spores, however, agree with those of *L. Capræ*, being smaller and much narrower ($125\ \mu$ by $2\ \mu$) than those of *L. arctica*, which are 165 -

180 μ by 6 μ . In the "*Icones Fungorum*" of A. N. Berlese Britain is not cited as one of the countries in which *L. Caprea* occurs; but it is stated to be widely distributed in Europe.

EPICYMATIA THALLOPHILA (Cke.) Sacc., (*Sphæria thallophila*, Cooke). 88, on *Lecanora subfusca*, on alders on the south side of Loch Rannoch.

Dr. M. C. Cooke states¹ that the original specimens on which this species was founded were collected by Dr. L. Lindsay in Glenshee, August 1856, and adds the following remarks upon it: "It is not improbable that this is a naked *Sphæria* springing from the wood beneath, and perforating the thin lichen thallus. A single small specimen is all we have seen, and that was insufficient to satisfy us on this point." This is evidently not the case, as we have found the perithecia occurring both on the thallus and on the apothecia of the lichen; and from one to fourteen perithecia have been observed on a single apothecium of the Loch Rannoch specimens.

DISCOMYCETES.

RHYTISMA SALICINUM (Pers.). 88, on living leaves of *Salix herbacea*, Ben Chalum, at 3000 ft.

NESOLECHIA CLADONIARIA (Nyl.). 88, on *Cladina uncialis*, var. *turgescens*, Ben Chalum, at 3200 ft. According to Nylander the spores are 10 μ by 3.5 μ , either hyaline or fuscous. The spores of the present specimen are fuscous, oblong, continuous, and measure 13 μ by 3.5 μ .

ASCOBOLUS FURFURACEUS (Pers.). 88, Ben Chalum at 800 ft., on cow-dung.

DASYSCYPHA BICOLOR, Fckl. 98, Ben Douran at 1100 ft., on sticks and dead branches.

D. CALYCINA Fckl. 88, on branches in the pine wood south of Loch Rannoch.

HUMARIA GRANULATA, Sacc. 88, near Crianlarich at 800 ft., on cow-dung.

THE ALPINE CERASTIA OF BRITAIN.

By G. CLARIDGE DRUCE, M.A., F.L.S.

OMITTING for the time any mention of *Cerastium cerastioides*, to use the name imposed on us by the Vienna Rules, I propose to bring before British Botanists some

¹ "Handbook of British Fungi," page 872.

suggestions on the two other species, which I trust may be of interest. No one can have explored the upper alpine zone of our British montane area without feeling that *C. alpinum* and *C. arcticum* (as it has been called) have many intermediate forms. Indeed, from time to time varieties of one or the other species have been made. Conspicuous among these is the var. *pubescens*, Syme, which is somewhat laconically described in "Eng. Bot.," 3rd ed., vol. ii. 85, as "Plant with short hairs," but which receives no mention in Babington's "Manual" or Hooker's "Students' Flora." In 1891 I worked the great mountains which lie to the south of Glen Spean and then saw plants in the Corrie of Aonach Mor which I had no doubt in my own mind were hybrids of *C. alpinum* with *C. vulgatum*, = *C. triviale* \times *alpinum*, as I recorded it in the "Ann. of Scot. Nat. Hist.," 129, 1892. One of our critical botanists thought it was "*C. triviale*, var. *alpestre*"; another, "*C. alpinum*, L., var. *pubescens*, Syme," and I have no doubt in one sense he was right, for I think it will be found that Syme's plant is made up of the hybrid above named, along with *C. vulgatum* \times *nigrescens*, and possibly *C. alpinum* \times *nigrescens*; and I have the large-flowered alpine form of *C. vulgatum* so labelled by a good botanist. Recently Dr. C. H. Ostenfeld, to whom I sent my alpine Chickweeds, says: "I have examined your rich material of large-flowered *Cerastia* from the British Isles with much interest. . . . It seems to me that you have in Great Britain only the strongly-haired form of *C. alpinum* [in Britain named *lanatum*, but not the true *C. lanatum* of Lamarck], then *C. Edmonstonii* [*C. nigrescens*], and lastly, *C. cæspitosum* [*C. vulgatum*], with its large-flowered variety *alpestre* [*alpinum*]." The Aonach Mor plant referred to, he says, is probably the hybrid I named. To the same parentage I should also refer plants (which Ostenfeld names hybrids) gathered on Ben Lawers and the Cairngorms, in each case *C. alpinum*, var. *pubescens*, had been a suggested name. From *C. vulgatum*, var. *alpinum*, Hartm., this hybrid may be distinguished by the more shaggy hairs, and usually by the broader and more obtuse leaves, and when in ripe fruit by the seed. But the difficulties of discriminating these large-flowered forms increase when we are investigating localities

where *C. alpinum*, *C. nigrescens*, and *C. vulgatum*, var. *alpinum*, occur together; as on Ben Lawers, Ben Heasgarnich, Aonach Mor, Braeriach, etc.

From Ben Lawers and Ben Heasgarnich I have plants which Ostenfeld names as almost certainly *C. alpinum* × *nigrescens*; and the same combination is probably also present in a plant gathered on the Cairngorms. These also have been named var. *pubescens*, Syme. Still a third hybrid occurs, which I have gathered on the cliffs of Clogwyn y Garnedd, Snowdon. This has much narrower and much less hairy leaves, with quite large flowers. It is *C. vulgatum* × *nigrescens*. It grew with *C. vulgatum*, var. *alpinum*, and *C. nigrescens*, and had been named var. *pubescens*, Syme, by an English expert.

It will be noticed that I have used the name *C. nigrescens* for the plant called *C. latifolium* by Smith, who mistook it for the continental Linnean species, and more recently described by Lange (*Flora Danica*, 1880, fasc. 50, p. 7) under the name *C. arcticum*. According to Ostenfeld,¹ Lange's descriptions and drawings are based partly upon a condensed form of *C. alpinum* from Greenland, and partly on East-Iceland plants of Smith's (not Linnæus) *latifolium*, to which Ostenfeld applies the name *C. Edmonstonii* (Wats.), Murbeck and Ostenfeld, which is based on *C. latifolium*, var. *Edmonstonii*, Watson, "Lond. Bot. Soc. Cat. of British Plants," 1844, surely a *nomen nudum*.

There is no rule in the 'Vienna Acts' which makes it compulsory to retain a varietal name when raising it to a species. There appears, however, good reason for using the name *C. nigrescens*, Edmonston. That acute botanist describes and figures the Balta Sound plant ("Phyt." 497-500, 1843) under the name *C. latifolium*, L., and gives figures of its allies to contrast or compare with it. Subsequently ("Phyt." 96, 1845) Edmonston sent specimens to the Botanical Society of London, labelled *C. nigrescens*, Edmonston, "Fl. Shetl." *ined.*; but it may be argued that the printing of this in "Phyt." *l.c.* 96, is not a valid publication. In the "Rep. of the Botanical Society of London," Feb. 7, 1845, p. 95, the

¹ Mr. N. E. Brown, "E.B. Suppl." 41, says "the figure t. 2693 B. is inaccurate."

Secretary states Mr. Edmonston presented specimens of the Shetland *Cerastium* which occasioned some discussion among British Botanists in the year 1843; Mr. E. then described the plant as "a new British *Cerastium*" ("Phyt." 1, 497) identical with the Linnean *C. latifolium*, but distinct from the Welsh and Highland species, described under that name in the works of Smith and other English authors. Although differences of opinion were then stated respecting the Highland species, it seemed generally agreed that the Shetland plant was properly referred to the *C. latifolium* of Linnaeus. The specimens now presented to the Society, however, are labelled *Cerastium nigrescens*, Edmond., in "Shetland Fl." ined. It would thus seem that Mr. Edmonston has changed his opinion regarding its specific identity with the Linnean species. In the "London Catalogue" the plant is given as a variety *Edmonstonii* of *C. latifolium*, L.; but it may be doubted whether Mr. Edmonston's specimens can be distinguished from the Highland and Linnean *C. latifolium*, even as a variety merely; there is certainly nothing in the form of the leaves to keep them distinct. . . . G.E.D.

In the preface to the "Shetland Flora," p. xv, 1845, the author alludes to it under the name *C. nigrescens*, which is, I think, a valid publication; but in the text, p. 29, under the name *C. latifolium*, var. *nigrescens*, Edmonston says: "Mr. Watson, after an investigation of numerous specimens still considers this plant as not truly distinct from *C. latifolium*, and from deference to his authority I give up the point." But the fact remains that Edmonston first described it as a species (*C. latifolium*), that in the preface to his Flora he writes *C. nigrescens*, that in the meantime he had distributed specimens under the name *C. nigrescens* to the "Bot. Soc.," and that the name *C. nigrescens* had been printed in the "Phyt." 95, 1845.

Just a word as to the distinctness of the Shetland from the British Alpine form; Mr. Beeby in "Rep. of Exchange Club" 1898, p. 568, says, when he first gathered the plant in 1886: "I brought home roots . . . and also a bag of its native soil. Under these conditions it maintained the dark purplish-copper colour of its foliage fairly well. . . . In 1897 and 1898, I brought home seeds and roots" which were grown in

a mixture of Surrey soils. "These plants have entirely lost their original colour and have become completely green, so that it appears that the only character which separates this variety from the type, is merely temporary and due to habitat. The serpentine gravels of Unst contain a number of minerals, notably chromate of iron, and the colour of the leaves may probably be due to the influence of one of them." Ostenfeld, also *in litt.*, says the Unst plant "has no systematic value" apart from the mountain plant. Therefore there is no need to keep up a name to distinguish the alpine from the Balta Sound plant.

In "Journ. Bot." 386, 1898, Mr. F. N. Williams stated from an examination of authentic specimens, I believe this to be a hybrid between two forms of *alpinum*. This cannot be the case since *nigrescens* is found where *C. alpinum* is absent as at Unst, and in other places in Scotland. While Mr. N. E. Brown, in "Suppl. to 3rd ed. of E.B. 42, 1891," says, "On comparing the seeds of typical *C. latifolium* with those of the British plant *arcticum*, including var. *Edmonstoni*, I do not find any difference of kind, but only a difference of degree, the seeds of the British plant are smaller than those of typical *C. latifolium*, although considerably larger than those of *C. alpinum*, but the testa of thoroughly ripe seeds is loose, although nothing like so inflated as in *C. latifolium* . . . so that I think our plant is really *C. latifolium*, but a form with smaller seeds, for which the varietal name *Smithii*, Syme, may be retained. Mr. F. N. Williams, "Journ. Bot." p. 493, 1898, says, "I have examined the material indicated by Mr. N. E. Brown, and am disposed to concur with him in adding *C. latifolium* to the British Flora. I do not, however, agree with him in identifying *C. arcticum* with *C. latifolium*, var. *Edmonstoni*, though there may be some difficulty in distinguishing them in the dried state. All the more reason is there against according to *C. arcticum* specific rank."

I think, however, we may safely separate as a species *C. nigrescens*, Edmonston, from the continental *C. latifolium*, as, in addition to the seed characters alluded to there are other differences which are sufficient to give it specific value, and as Syme ("E.B." ii. 88) says, "it is very doubtful if [this is] the *C. latifolium* of Linnæus."

Syme's *C. alpinum*, var. *pubescens*, is described tersely and inadequately as "Plant with short hairs," and is queried as being the *C. alpinum*, var. *hirsutum* of Gren. and Godr., "Fl. Fr." i. 271. Mr. Hanbury tells me there is no type in Mr. Boswell Syme's herbarium, nor have I been able to find any specimen labelled by him in the national herbaria. We may therefore safely delete it from our flora.

Our British Alpine Cerastia therefore appear to be:—

CERASTIUM ALPINUM, *L.*—Plant prostrate, woolly; leaves usually broadly oval-obovate or elliptical, densely covered with long shaggy articulated hairs, with some shorter glandular ones, first pair of bracts smaller than stem leaves, with usually a narrow membranous border; secondary bracts sub-membranous or with a distinct membranous border; sepals broadly lanceolate, seeds $\frac{1}{20}$ in. across, acutely tubercled (in *C. vulgatum* they are about $\frac{1}{30}$ in. across and more pear-shaped). Helvellyn, 69!; 70; Ben Lawers, 88!; Thulachan, 89!; Canlochan, Loch Brandy, 90!; Lochnagar, 92!; Braeriach, 96!; Glen A'an, 94!; Ben Laiogh, 98!; Aonach Mor, 97!; Inverlael, 105!; Ben Dearg, 106.

VULGATUM (= *C. SYMEI* = *C. ALPINUM*, *L.*, var. *PUBESCENS*, *Syme*, p.p.). Plant less caespitose, usually more erect, with narrower leaves, which are less hairy, the hairs shorter and nearly eglandular. Ben Lawers, 88!; Ben Laoigh, 98; Aonach Mor, 97; Braeriach, 96; Glen A'an, 94. *C. alpinum* ascends to 3700 on Cairngorm, 3100 on Ben Dearg.

NIGRESCENS (= *C. BLYTHII*, *Baenitz*). Plant less woolly, leaves more acute and greener, with shorter pubescence; upper bracts with distinct membranous margin; seeds often (? always) abortive. Scotch mountains—Ben Heasgarnich, Ben Lawers, 88!.

C. NIGRESCENS, *Edmonston*, = *C. LATIFOLIUM*, *Sm.* (not *L.*) = *C. LATIFOLIUM*, var. *GLACIALE*, "Bab. Man." 56, 1847, *C. LATIFOLIUM*, var. *Edmonstoni*, *Wats.*, "Lond. Cat." 2, 1844, *nomen nudum*, "Bab. Man." 3rd ed., 52, 1851, = *C. ARCTICUM*, *Lange*, "Fl. Dan." 1880, fasc. 50, p. 7 *pro parte*; = var. *EDMONSTONII*, *Beeby*, "Scot. Nat." 24, 1887; = *C. ALPINUM*, var. *EDMONSTONII*, *Hook.*, "St. Fl." 3rd ed., 60, 1864; = *C. EDMONSTONII*, *Murbeck* and *Ostenfeld*, "Bot. Notiser," 246, 1898. Plant ascending, pale green, in the Shetland plant often brownish-purple; leaves pale green, with short gland-tipped hairs and longer yellowish, stiff, articulated hairs; first pair of bracts not much smaller than leaves, herbaceous; secondary bracts, when present, with a very narrow membranous border;

sepals ovate-lanceolate or oval-obtuse, seeds $\frac{1}{16}$ in. across, rugose, without sharp tubercles. Snowdon, 49 !; Ben Lawers, etc. 89 !; Little Craigindal, 92 !; Glen A'an, 94; Cairngorms, etc. 96 !; Aonach Mor, etc. 97 !; Cuchullins, 104; Ben More, 107; Unst, 112.

VULGATUM (= *C. ALPINUM*, *L.*, *var. PUBESCENS*, *Syme, p.p.*). Plant prostrate, ascending; leaves narrow, acute, pubescence, sparse, sparingly glandular; flowers large. Snowdon, Clogwyn, 49 !.

C. NIGRESCENS ascends to 3800 feet on Ben Lawers, to 3500 feet on Aonach Mor, and to nearly 4000 feet on Braeriach, and descends to near the sea-level on Unst.

April 1910.

CONTRIBUTION TO A FLORA OF CAITHNESS. No. V.

By ARTHUR BENNETT, F.L.S.

(Continued from p. 229, No. 76, October 1910.)

HYPOCHÆRIS RADICATA, *L.*—A small one-flowered form from Yarrows, R. Bain, *sp.*

TRAGOPOGON MINUS, *Mill.*—The Reay plant found by Mr. Miller belongs here, and not to *H. pratense*, *L.*

VACCINIUM MYRTILLUS, *L.*—Gardiner, in his "Flora of Forfarshire," says this is known as Blaeberry in Forfar, and Scotland generally; but Dr. Prior¹ restricts this name to *V. uliginosum*—in which he seems to be wrong, according to Scottish authors. In an old document dated 1634,² relating to the disposing of some holding in the parish of Canisby, the name Blaeberry-quoy's (Blaeberrieuquayes in the original Latin) occurs. Mr. J. Mowat of Glasgow wrote me that "Blaeberryquoy's was the name of a small farm or croft at Freswick, now merged into the large farm. Most likely the name is derived from the berries found in the neighbourhood." Doubtless this would refer to the Blaeberry. Mr. A. Somerville told me that undoubtedly Blaeberry is the old Scottish spelling and pronunciation of Blue-berry. A very interesting article on the popular names of *Vaccinium* in Europe, by Dr. von Kupffer, will be found in "Korresp. d. naturf. Vereins zu Riga," 1906, pp. 141-154.

¹ "Pop. Names of British Plants," 1870, pp. 24, 288. [*V. Myrtillus* is certainly the "Blaeberry," as generally understood in Scotland.—ED. "A.S.N.H."]

² "History of Caithness," ed. 2, 1887, p. 337.

ARCTOSTAPHYLOS ALPINA, *Spreng.*—Mr. Nicolson names Ben Dorrery as a station for this. This will be, I suppose, about 500 ft. alt., as there is a B.M. about $\frac{3}{4}$ mile away given as 387', and the contour of 500 is within the same distance. In "Scot. Nat.," 1889, p. 42, Mr. Grant and I give "Ben Shurrery, 1852," from Dick's Herbarium. Is this the same station? As Lake Shurrery is within a mile and a half it may be so. It is much more abundant in Sutherland.

AZALEA PROCUMBENS, *L.*—Mr. Nicolson, *l.c.*, says he gathered this, on 5th June 1884, "on the top of Morven, on the east side, near a 'well' or natural spring."

ERICA TETRALIX, *L.*—Robert Dick observes: "I have watched *Calluna vulgaris* and *Erica cinerea*, and never yet among thousands of thousands found a notable variety. But with *E. Tetralix* the case is very different. It is subject to strange shiftings and changings, and I have some delightful varieties of it" (Smiles' "Life of R. Dick," p. 294).

PYROLA ROTUNDIFOLIA, *L.*—I find Mrs. Wahab gathered this within a $\frac{1}{4}$ mile of the Caithness border, *i.e.* between the Ord Point and Dun Glas, where the altitude "652" is marked on the Ordnance Map.

P. MEDIA, *Su.*—Lybster Burn, J. Grant, *sp.*; Scorrielett, A. Sutherland, *sp.*

*VINCA MINOR, *L.*

PRIMULA SCOTICA, Hooker.—"Prof. Balfour showed a piece of turf with several specimens of *P. scotica* from near Thurso, sent by Mr. R. Heddle, showing the flowering from May to September, and that the later flowers had the limb of the corolla much thrown back" ("Trans. Bot. Soc. Edin.," 1847). Mr. Nicolson says (*l.c.*) the local name for this is "Dusty Miller."¹ I cannot help thinking I have heard this name applied to some other British plant, but cannot remember to what, if so applied.

SYMPHYTUM TUBEROSUM, *L.*—Just above water-level on the Wick river, 1 mile above Wick, R. Bain, *sp.*

*S. ASPERRIMUM, *Bieb.*—Thurso, Druce ("Ann. S.N.H.," 1904, 171).

MYOSOTIS PALUSTRIS, *Hill*, var. NEMOROSA (*Besser*).—On the Reay sands, by a small rivulet, Druce, *l.c.* Besser ("Enum. Vol., Pod.," etc., 1822, p. 52) gives this as a species; it is a plant of Lithuania, Volhynia, and Siberia.

¹ [The name "Dusty Miller" is applied in some parts of Scotland to *Primula Auricula*, because of the dusty coating of wax on the leaves, and may probably be used for other species that show a similar covering.—ED. "A.S.N.H."]

MERTENSIA MARITIMA, *Gray*.—Edge of sand, seashore at Ackergill, Sinclair Bay, R. Bain, *sp*.

*ANCHUSA SEMPERVIRENS, *L*.

*ANTIRRHINUM MAJUS, *L*.

SCROPHULARIA NODOSA, *L*.—Wick river where sheltered by whin bushes, A. Sutherland, *sp*.

MIMULUS LANGSDORFFII, *Don*.—Near Watten.

var. GUTTATUS (DC.).—Newton, Nicolson, *l.c*.

VERONICA CHAMÆDRYS, *L*.—Braes above Wick river near Wick, R. Bain, *sp*.

var. INCISA, *G. Froel*.—Watten, A. Sutherland, *sp*.; cf. Williams' "Prod. Fl. Brit." p. 6, (1909) p. 295, as to this variety.

V. HEDERIFOLIA, *L*., *f.* TRILOBA (*Opiz*), (= *V. triloba*, *Opiz*, "Naturalientausch," 1824, p. 108).—The Glebe, Wick, J. Grant, *sp*.

V. OFFICINALIS, *L*., var. MULTICAULIS, *Wallr*., "Sch. crit.," 1822, p. 22.

Is var. PROCERA, *Wilk*., the same? Above the river near Wick, R. Bain, *sp*.

EUPHRASIA FOULAENSIS, *Towns*.—Scrabster, Druce, *l.c*.

E. ROSTKOVIANA, *Hayne*.—Reay, E. S. Marshall.

E. CURTA, *Fr*., var. GLABRESCENS, *Wettst*.—Grassy headland, Downreay, H. E. Fox, 1885.

E. BREVIPILA, *B. et G*., var. SUBEGLANDULOSA, *Towns*.—Claridon, Druce, *l.c*.

ODONTITES SIMPLEX, *Krok, ex Hartm*. "Hand. Sk. Fl." ed. 1, 1820 (*O. litoralis*, *Fries*, "Sum. Veg. Scand.," 1846, p. 19; *Euphrasia Odontites*, var. *litoralis*, *Fries*, "Fl. Scanica," 1835, 40; *Bartsia Odontites*, β *litoralis*, *Reich*., t. 1727, f. 2; *Odontites verna*, *Reich*., subsp. *litoralis*, *Fr*., *Nyman*, "Consp. Fl. Europ.," 1881, 551).—Shore near Wick, R. Bain, *sp*.; Yarrows, A. Sutherland, *sp*.

Dr. Williams ("Prod. Fl. Brit.," 1909, p. 216) gives this as of "Nyman, 'Syll. Fl. Europ.,' 127 (1854)," and says all other references are wrong. This surely is too sweeping. It is true that *Fries*, at p. 196 of the "Summa," calls it "*Euphrasia litoralis*," but at p. 19 he names it as *Nyman* does, and *Nyman* no more describes it than *Fries* does under *O. litoralis*. But the proper name seems to be what I have given it. *Hartmann* down to his 1879 ed., p. 155, retains *Krok's* name from the *Botaniska Notiser*.

RHINANTHUS STENOPHYLLUS, *Schur*.—Thurso, and near John O'Groat's, Druce, *l.c*.

- R. BOREALIS, *Druce*.—Sea-cliffs, Freswick, Thurso, J. Grant, *sp*.
- MELAMPYRUM PRATENSE, *L.*, var. ERICETORUM, *Oliver*.—Dunbeath, W. R. Linton, 25.7.1888.
- UTRICULARIA VULGARIS,¹ *L.*—Marked with doubt by Mr. Nicolson of Wick. Considering that the surrounding counties have records of two or more species, it seems strange there are no Caithness localities on record. *U. vulgaris* occurs in Skye, W. Ross, O. Hebrides (?),² Orkneys, and Shetland. In a triangle between Watten, Wick, and Lybster there is very similar ground to that where the genus occurs in Sutherland.
- STACHYS AMBIGUA, *Sm.*—Sandside, Messrs. W. Borrer and Hooker, Sept. 1808 ("Eng. Bot.," t. 2089, Nov. 1, 1809).
- PLANTAGO LANCEOLATA, *L.*, var. MINOR, *Rapin*.—Dunnet Links, E. S. Marshall, 1900, *teste* Williams, "Prod. Fl. Brit.," 1909, p. 358.
- P. MARITIMA, *L.*, var. PYGMÆA, *Lange.*, and var. DENTATA, *Weitz.*—Downreay, *Druce, l.c.*
- P. MARITIMA, *L.*, var. HIRSUTA, *Gilib.* (sub *alpina*, *teste* Williams, *l.c.*)—Stroma Isle, Miss Geldart, *sp*.
- ATRIPLEX BABINGTONII, *Woods*, var. CANESCENS, *Hartm.*, "Hand. Sk. Fl.," ed. 2 (1879), 348.—Proudfoot, J. Grant, *sp.*; Duncansby, Miss Geldart.
- POLYGONUM VIVIPARUM, *L.*—Braes near Buchollie Castle, Freswick, 1908, Mr. G. Stalker, *sp.*, new record for the county. Small specimens tending towards the var. *alpina*. Occurs in E. and W. Sutherland, O. Hebrides (!), Orkney, and Shetland (var. *alpina*), Beeby, *sp*.
- *DAPHNE LAUREOLA, *L.*
- *EUPHORBIA EXIGUA, *L.*
- *HUMULUS LUPULUS, *L.*
- MYRICA GALE, *L.*—Moss of Kilminster, D. Doull, *sp*.
- BETULA PUBESCENS, *Ehrh.*, var. PARVIFOLIA, *Wimm.*—"Add. Rec. Scot. Plants for 1889"; "Sc. Nat.," 1890, p. 272.
- *CARPINUS BETULUS, *L.*
- *TAXUS BACCATA, *L.*
- ORCHIS ERICETORUM, *Linton*.—Holborn Head; near Castleton and John O'Groat's, *Druce, l.c.*
- HABENARIA VIRIDIS, *Br.*—Scrabster cliffs, with broadly oval leaves, *Druce, l.c.*

¹ For this genus see "Trans. Bot. Soc. Edin." xx. (1894), 110; "Proc. Dorset. N.H.F. Club," xv. (1894), 51; "Ann. Scot. N. Hist.," 1903, pp. 123, 250, and for 1910.

² See "Ann.," 1910, p. 170.

**CROCUS VERNUS*, *All.*; **NARCISSUS PSEUDO-NARCISSUS*, *L.*;
 **GALANTHUS NIVALIS*, *L.*; **FRITILLARIA MELEAGRIS*, *L.*; and
 **COLCHICUM AUTUMNALE*, *L.*

JUNCUS GLAUCUS, *Leers.*—Banks of Thurso river, A. Davidson,
 ("Journ. Bot.," 1886, p. 24).

J. *ALPINUS*, *Vill.*—Marsh, Forse, 5th Aug. 1908, Miss Helen Lillie, daughter of the Rev. D. Lillie of Watten Manse, a student of the Caithness mosses. An addition to the Flora. It seems odd that *alpinus* has not been recorded from the Orkneys or Shetland. Yet, on a specimen gathered by Dr. Boswell Syme, in Orkney, 1887, Dr. Buchenau remarked (11.12.1898): "*An J. anceps* × *lamprocarpus*, vel *alpinus* × *lamprocarpus*? capita ut in *J. lamprocarpo*, sed perigonium *J. ancipitis* vel *alpini*." It should be sought in Orkney and the O. Hebrides, as Dr. Buchenau suggests.

LUZULA MULTIFLORA, "DC.," var. **SUDETICA* (DC.), (*L. sudetica*, DC., "Fl. française" (1815), iv. p. 306); London Catalogue gives DC. as the author of *multiflora*; but Lejeune in his "Fl. of Spa" (1811), i. p. 169, was the author, according to Dr. Buchenau in "Kr. Zns. europ. Juncaceen").—Near Thurso, J. Galloway, *sp.*; Loch Duran, E. S. Marshall, *sp.*; remarked on a specimen thence, "likely *J. anceps* × *lamprocarpus*."

SPARGANIUM SIMPLEX.—Watten, J. Grant, *sp.*

POTAMOGETON ALPINUS.—"Dr. Tyacke brought two specimens of *Potamogeton rufescens* from Caithness" (Dr. G. Johnson in Watson's "New Botanists' Guide," 1837, p. 517). In Watson's "Outlines Geogr. Dist.," 1832, p. 288, no mention is made of this as a Caithness plant, so that 1837 is its first record from the county.

P. *NITENS*, *Weber*, var. *PRÆLONGIFOLIA*, *Tis.*, = "var. *latifolius*, *Fieb.*" = var. *maxima*, *A. Benn. olim.*

P. *FILIFORMIS*, *Pers.*, small form between type and var. *FASCICULATUS* (*Wolfg.*).—Loch Watten, Dr. Davidson, *sp.*

SCIRPUS CÆSPITOSUS, *L.*—Stroma Isle, Miss Geldart, *sp.* Growing in dense clumps with arcuate stems, in some to $\frac{2}{3}$ of a circle. It is difficult to account for this, as the normal form was growing near, and there is no sign of insect or fungus injury. The same thing occurs with *Schœnus nigricans* in Cornwall.

CAREX KATTEGATENSIS, *Fries.*—Mr. G. Nicolson, *l.c.*, remarks that this plant was so abundant "that it used to be mown for bog-hay for farm-purposes; but probably the recent river-improvements,—the banking and deepening of the sandbank on which the *Carex* grows,—must have worked havoc among its ranks."

But even if so, there is plenty more farther up the river towards Sibster. See "Ann. Scot. Nat. Hist.," 1904, p. 179.

- C. INCURVA, *Light*.—Mr. Nicolson, *l.c.*, records this from "Shinval, a place in the S.W. of Caithness, and several miles inland."
- C. GOODENOVII, *Gay*, var. FULIGINOSA, *A. Br.* (sub *cæspitosa*), 1843 (= *C. melæna*, Wimmer, 1849).—Caithness Moors, J. Grant, *sp.*
var. STENOCARPA, *Kük.*—Thurso, Druce, *l.c.*
var. CHLOROSTACHYA (Reich., sub *vulgaris*), *Asch.*—Loch Duran, Druce, *l.c.*
- C. FLAVA, *L.*, var. CYPEROIDES, *Marss.* (sub *Æderi*).—Wick river, Dr. Davidson, *sp.*
- C. FLAVA, *L.*, var. MINOR, *Towns.*—Loch Winless, E. S. Marshall, *sp.*; Scouthall, J. Grant, *sp.*
- C. HORNSCHUCHIANA × FLAVA, var. LEPIDOCARPA.—Three miles up the Wick river with the parents, E. S. Marshall (1900), *sp.*
- C. XANTHOCARPA, *Degl.*—Dunnet Links, E. S. Marshall, *sp.*
- C. BINERVIS, *Smith*, var. ALPINA, *Drejer* (= *C. Sadleri*, Linton, *teste* Kükenthal).—Yarehouse, J. Grant, *sp.*; near Wick, J. Grant, *sp.*
- C. ROSTRATA, *Stokes* (*ampullacea*), var. ANGUSTIFOLIA, *Druce, l.c.*—Watten. Mr. Druce does not say whether Herr Kükenthal notices this.
- C. CATTEYENSIS, *mihi*.¹—Marsh, Winless, 4.9.1908, Miss H. Lillie. (*C. rostrata*, *Stokes* × *binervis*, *Sm.*? *C. inflata*, *Huds.* × *binervis*, *Sm.*? *C. ampullacea*, *Good.* × *binervis*, *Sm.*?)

Typical *rostrata* occurs with this; in fact, a specimen is mixed with these doubtful specimens. The whole are absolutely sterile; I cannot find a perfected nut in any.

The male spikes are those of *rostrata*, the female more like fine *binervis*, with mostly obtuse glumes with the midrib very conspicuous. The fruits vary from almost *binervis*-like to *rostrata*-like; glumes from obtuse to apiculate. I cannot find that such a hybrid is on record. Richter gives none such, neither do the latest Norwegian or Swedish Floras. The station is low, 20-60 ft. above O.D. I have not seen *binervis* from this parish, but have it from the next.

HIEROCHLOE ODORATA, *Wahl.* (*H. borealis*, Roem. et Schult.).—In Mr. Nicolson's paper (*l.c.*) he writes: "It has also been reported from the Clova Hills in Forfarshire. In Dick's Herb. at Thurso Museum specimens are so marked."

No mention is made of any specimens extant from Glen Cally or Kella in "Notes from the Royal Botanic Garden,

¹ *I.e.* "Cattey," the Gaelic name for Caithness.

Edinburgh," 1904, p. 121; neither is any specimen mentioned in "The Scottish Naturalist," 1884, p. 268. It is a matter for regret that no botanist has examined Dick's Herbarium and recorded the result.

DESCHAMPSIA SETACEA, *Richter* (*Aira uliginosa*).—Was found at Watten by Mr. Grant, *sp.*

D. CÆSPITOSA, *Beauv.*, var. AUREA, *Wimm. et Grab.* (sub *Aira*).—Ackerhill Links, in wet places, W. W. Reeves, *sp.*; by a rivulet a mile or so south of Wick, E. S. Marshall, *sp.*

CATABROSA AQUATICA, *Beauv.*, var. GRANDIFLORA, *Hackel*.¹—Named by Prof. Hackel in 1889, the specimens sent to him from Dunnet sand by F. J. Hanbury.

FESTUCA PRATENSIS, *Huds.*—"Top. Botany," ed. 2, 1883.

*BROMUS ARVENSIS, *L.*

KCLERIA BRITANNICA, *Domin.*—Wet places near river, Westerseat, J. Grant, *sp.*

f. MAJOR, *Domin.*—E. S. Marshall, "Journ. Bot.," 1906, p. 103.

POA PRATENSIS, *L.*, var. STRIGOSA, *Gaud.*—By the river near Thurso, W. Galloway, *sp.*

P. PRATENSIS, *L.*, var. SUBCERULEA (*Sm.*).—Border of the site of Loch Duran, J. Grant, *sp.*

P. TRIVIALIS, *L.*, var. GLABRA, *Doell.*—Freswick, by the sea, J. Grant, *sp.*

AGROPYRON REPENS, *Beauv.*, var. BARBATUM, *D.-Jouve.*—Freswick, by the sea, Dr. Ward, *sp.*; near Lighthouse, Wick, J. Grant, *sp.*

PHEGopteris POLYPODIOIDES, *Fée.*—Dick remarks: "On one sloping brae grew *P. Phegopteris*, and I sat down beside it. I remarked, though of all sizes from one inch to twelve, every one was true to the type. Passing on to a rocky ledge I saw a cluster of the fern I had been in quest of. That, said I, is the *P. Dryopteris* of learned men. More than fifty of the fern were growing before me, not one of them agreeing in any particular with the *Dryopteris* of the books."²

LYCOPodium SELAGO, *L.*—Moss of Kilminster, D. Doull, *sp.*; East Watten Moss, A. Sutherland, *sp.*

EQUISETUM PALUSTRE, *L.*, var. ARENARIUM, *Fr.*—Dunnet Links, E. S. Marshall, *sp.*

NITELLA OPACA, *Ag.*—Scarneclett, Druce, *l.c.*

¹ "Scot. Nat.," 1889, p. 91.

² Smiles' "Life," 1878, p. 299.

Species that should probably occur in Caithness :

<i>Ranunculus peltatus</i> , Schrank.	81	vice-counties.
<i>Sisymbrium Alliaria</i> , Scop.	99	,,
<i>Potentilla reptans</i> , L.	99	,,
<i>Erythræa Centaurium</i> , Pers.	102	,,
<i>Lycopus europæus</i> , L.	95	,,
<i>Scutellaria galericulata</i> , L.	103	,,
<i>Salix nigricans</i> , Sm.	20	,,
<i>Eriophorum latifolium</i> , Hoppe,	60	,,
<i>Carex hirta</i> , L.	98	,,
<i>Melica uniflora</i> , Retz.	96	,,
<i>Bromus giganteus</i> , L.	105	,,
<i>Isoetes lacustris</i> , L. (?)	25	,, (reported from Caithness).

ZOOLOGICAL NOTES.

Lesser Shrew in Perthshire.—On 19th November 1910, a Lesser Shrew (*Sorex minutus*) was found lying dead on a path in a larch wood, on the estate of Baledmund, near Pitlochry. We sent it to the Royal Scottish Museum, where our identification of it was confirmed. As there are only two direct records of this species in Mr. Harvie-Brown's "Fauna of the Tay Area and Strathmore," we think this occurrence may be worthy of a note.—LEONORA JEFFREY RINTOUL and EVELYN V. BAXTER, Largo, Fife.

Melanic Variety of the Orkney Vole.—During my last visit to Orkney, I saw several black specimens of the Orkney Vole, a pair of which are now to be seen in the Stromness Museum. There appears to be only one very small colony, or even family, known, and known only to one man, who procured these specimens, but who will not divulge their locality, except that it is on the mainland of Orkney and not far removed from Stromness.—H. W. ROBINSON, Lancaster.

[I have captured what appeared to be partially melanic examples of this Vole near Stromness, but these on examination proved to be merely in moult. I do not wish, however, to suggest that the specimens to which Mr. Robinson refers were not in full fur and are not melanisms. The under fur of this species is black, and when the longer hairs are moulted this under coating becomes very evident. I have moulting specimens which approach being entirely black.—W. E. C.]

The Birds of St. Kilda.—In order to carry the investigations on the migrations of birds, in which I have been for some years engaged, to the outermost fringe of the British Area, I visited St. Kilda during the past autumn. Here I remained, with George Stout as my

assistant, from 1st September to 8th October, and met with quite unlooked-for success. I was quite prepared to obtain negative evidence, or very little more, of the visits of migratory birds at such a far-western and remote station—remotest of all in the British seas. Fortunately the reverse happened, and no less than 54 species of birds *on passage* came under my notice. Of these 35 were new to the avifauna of the island, or an addition of 50 per cent to the species that had been previously known to occur there. Among the birds observed were a number of surprises—species which had not previously been recorded for Western Scotland, while the American Pipit (*Anthus pensylvanicus*) is new to the British fauna, and the Marsh Warbler (*Acrocephalus palustris*) to that of Scotland. A full account of the result of these investigations is in preparation, and will be published in due course.—WM. EAGLE CLARKE.

Bird Notes from Tiree.—The larger race of Wheatear (*Saxicola ænanthe*) may now have Tiree added to the localities frequented by it on autumn migration. On 8th October 1910, Mr. Peter Anderson shot two specimens and sent them to me at Dunipace. Mr. Anderson writes: "The Common Wheatears left here some time ago, and a crowd of this variety have come along within the last 10 days. They have been all along over the rocky, heathery, barren ground. Their antics on the ground are the same as the Common Wheatear, but the alarm note is different from the 'chuk, chuk,' of that bird. But," adds Mr. Anderson, "perhaps the season of the year may account for that. I have seen more than a hundred of them within the last week, and they are all the same as these two."

Mr. Anderson on 17th October sent me a White Wagtail in full winter garb—not a common phase of plumage to find them in in localities usually frequented by migrants. Along with Mr. Gladstone and Mr. R. Service ("Birds of Dumfriesshire") one may wonder whether new *lines of migration* (or lest objection be taken to that expression, let us say—*new haunts discovered*) have been followed by the species in their natural increase in numbers; or if the species had been overlooked by earlier writers and present-day observers. So far as Tiree is concerned, I cannot believe that Mr. Anderson has overlooked its distinctive points, as he has been acquainted with those migrants across Tiree as long ago as 1871.

The usual migration along portions of the West Coast has been in some measure watched and reported on by Mr. Anderson. Thrushes, Blackbirds, Robins, all arrived last week (*i.e.* the week previous to 17th October, the date of his last communication, to date of 22nd October). This migration is the same swing of the wave which strikes at Monach Isles, and along the west coast of the Long Island between Butt of Lewis and Monach, and which throws out stragglers, on a still more extended wing, as far as the lone isle

of St. Kilda, and the borders of the 100-fathom line. Long ago, we were informed that Monach Isles exhibited little migration at all, until late in the season—and usually little before the October “rush.”—J. A. HARVIE-BROWN.

Birds observed at Fair Isle during the year 1910.—The observations on the movements of birds at this famous station have been systematically and successfully prosecuted throughout the past year by Mr. Jerome Wilson. Her Grace the Duchess of Bedford visited the island during both the spring and autumn passage periods, and contributed very materially to the results obtained. Thanks to facilities afforded by Her Grace, I was enabled to visit Fair Isle during May, and saw much migration. As the result of these investigations, the movements of 129 species were chronicled: of these 95 were observed in spring and 105 during the autumn, while 75 were common to both seasons. As a full account of the various bird visitors to Fair Isle, now 198 in number, with particulars of their times of appearance, and other information, is in an advanced stage and will be shortly published, it is not proposed to do more here than mention the new species which came under notice in 1910. These were the Hoary Redpoll (*Acanthis exilipes*), Holböll's Redpoll (*A. linaria holboëlli*), the Great Titmouse (*Parus major*), Bewick's Swan (*Cygnus bewicki*), the King Eider (*Somateria spectabilis*), the Red-necked Phalarope (*Phalaropus fulicarius*), and the Yellowshank (*Totanus flavipes*). The two first and the last are new to the fauna of Scotland. A considerable number of rare and interesting visitors also occurred.—WM. EAGLE CLARKE.

Lauderdale Bird Notes.—During the past summer we became aware of the presence of Hawfinches (*Coccothraustes coccothraustes*) in the garden by the very visible signs of destruction among the peas, different entirely from those caused by Tits or Sparrows. For three years these birds have almost ruined the pea-rows. This summer, as fast as each row ripened, Hawfinches came to them. We could explain it only on the hypothesis that the birds were constantly in the vicinity, though but once was a hurried glimpse of one got. A nest of the Hawfinch, however, was found lately, when the gardener was pruning, in one of the standard apple trees, nine feet or thereby from the ground. Apart from the fact that Mr. Eagle Clarke identified it, there was no mistaking the loose, rather flat structure of moss and spruce-fir twigs outside, and the lining of fibres and twigs within. The nest was quite close to a frequented path, and the presence of both Blackcap and Garden Warblers in the garden during the earlier fruit season made us watch the bushes and trees more closely than usual. Withal, but for the nest, the destruction of the peas, and the suspected glimpse of one, we should have been quite unconscious of the interesting fact that these rare and very secretive birds lived so much in the vicinity.

The Tree Sparrow (*Passer montanus*) is another rather uncommon bird in the Border district. Here, however, it has come, at least, for several years, usually in January. Last January, on a bright sunny morning, one might have been heard singing his comparatively sweet, lilting song in a bush close to the avenue. Before the bird was seen, the notes were thought to be the low broken warblings of a very early Thrush. During the nesting season a pair successfully reared two broods in bird boxes set up on trees quite near the house. The birds, through the perfect security they enjoy, have grown a good deal tamer. At first, the slightest alarm was enough to send them high into the air, and they evidently flew some distance away. Now they feed freely in a food-box among the trees with the other Common Sparrows. This October Tree-Sparrows have been seen constantly.

Goldfinches (*Carduelis carduelis*) are said to nest near Melrose. Here they come occasionally in winter, and have been seen by myself as well as others among the seeds by the roadside. A local roadman who is interested in them as cage birds saw a flock of twenty last winter close to the road where he wrought.—WM. M'CONACHIE, The Manse, Lauder.

Bullfinches, Mealy Redpolls, and Crossbills in Scotland.—Among the chief incidents of interest to ornithologists in Scotland, during the past autumn, were the visits of numbers of the large Continental race of the Bullfinch (*Pyrrhula pyrrhula*) and the hordes of Mealy Redpolls (*Acanthis linaria*). The Bullfinches were reported from Unst (Dr. Edmonston Saxby), Lerwick (Mr. J. S. Tulloch), and Fair Isle, in Shetland; and the Misses Baxter and Rintoul record them from the Isle of May. They seem to have first been noticed on 24th October, and in some localities as many as ten were seen on single days. The Redpolls were even more widely distributed, and were in vast numbers; indeed so many were taken by bird-catchers that no sale for them could be effected. These birds were first reported on 16th October, and afterwards in abundance. Among them were some numbers of Holböll's Redpoll (*A. linaria holboëlli*). The Shetlands were again visited by Crossbills (*Loxia curvirostra*) in some numbers. They were first detected on 20th June, and were under notice until 19th September. Several were seen by me, all of which belonged to the Continental race.—WM. EAGLE CLARKE.

The Waxwing in Haddingtonshire.—On 25th November a Waxwing (*Ampelis garrulus*) was taken alive near the village of Tranent. When first observed it was feeding on a wild rose-bush, when a well-directed stone partially stunned the bird, and enabled a boy to secure it. The bird was given to me the following day, and is now (November 29th) alive and fairly healthy. It is in all probability an old bird, if one may judge by the deep black throat and the gloss on the plumage. The wax-like tips to the secondaries

are only four in number on each wing. Since the bird came into my possession it has eaten doghips, haws, rice, grapes, and apple, but its favourite food seems at present to be currants.—R. L. RITCHIE, Dunloe, Tranent.

Persistency in nesting of Song Thrush.—Mr. Wm. MacGillivray of Barra sends me the following note upon the persistency of a Thrush in nesting this season in Eoligary garden.—He says:—A Mavis nested in an ivy tree in Eoligary garden and laid five eggs on the 28th April 1910. These eggs were destroyed by rats. In the third week in May it nested a second time in a rhubarb plant and had four eggs. These also were destroyed by rats. In the second week in June, it nested a third time in a pear tree and had one egg. This also was again destroyed by rats. In the first week of July it nested a fourth time in the St. Barr Churchyard, Eoligary, and hatched four birds, which were on the wing the last week of the month.—J. A. HARVIE-BROWN.

Albino Wood-Warbler in Dumfriesshire.—A perfectly pure white specimen of the Wood-Warbler (*Phylloscopus sibilatrix*) was obtained near Drumlanrig, Thornhill, at the end of July 1910. It only lived some four hours after its capture, when it was stuffed by Mr. Lockerbie, Chemist, Dumfries. The specimen, which I have seen, is now in the possession of Mr. Jas. Graham, Carronbridge.—HUGH S. GLADSTONE, Capenoch.

Hen Harriers in Peeblesshire.—About the beginning of November two Hen Harriers (*Circus cyaneus*) were seen hunting the moors in the West Linton district, and on the 17th one of the birds, an adult female, was shot on the "White Moss," at Medwyn. Its crop contained the flesh of a grouse. The Hen Harrier is now a very rare visitor to the district.—T. G. LAIDLAW, Halmyle.

Migration of Whooper Swans.—The passage of Whooper Swans northwards over the Orkneys commenced this year (1910) on 25th March with a herd of eleven, which, coming from the south, alighted on the Loch of Harray, to be joined later in the morning by other herds of five and eleven. After washing themselves in the fresh water, they all departed in the middle of the afternoon in one herd. The main migration over Orkney of this species takes place during the second week of April, when thousands may be seen heading N.N.W. and flying comparatively low, very few breaking their journey then, as they are possibly in a hurry to reach their breeding grounds.—H. W. ROBINSON, Lancaster.

Wigeon nesting in Forth.—In the October number of the "Annals" there appeared an interesting note from Mr. Evans on the nesting of the Gadwall and the Wigeon in "Forth." It seems evident from what he says that the first identified Gadwall's nest, found at the loch referred to, was that recorded by Misses Rintoul

and Baxter, but it may interest your readers to know that the first identified Wigeon's nest was found by myself and Mr. David Hamilton on the 8th June 1907.—J. KIRKE NASH, Edinburgh.

[The fact that the Wigeon bred in the Forth area, at Loch Leven, was first made known to us in 1901 by Mr. J. G. Millais in his "Wildfowler in Scotland." Here, at p. 40, he tells that he had the first reliable information of its breeding in 1880.—EDS.]

White Grouse near Alyth.—I am informed by my friend, Mr. H. S. Holt, that a white Grouse (*Lagopus scoticus*) was shot on 13th August 1910 at Bamff, Alyth, by the Hon. D. O'Brien. It was sent to Messrs. Rowland Ward for preservation, who write me that it is a female and a very fine bird; but I have not personally seen the specimen.—HUGH S. GLADSTONE, Capenoch.

Blue Shark in the Firth of Forth.—As we were walking along the shore in Largo Bay on 8th December we found a Blue Shark (*Carcharias glaucus*) lying dead, cast up by the sea. It looked in perfect condition, but Mr. Kirk, Taxidermist, Glasgow, to whom it was sent, tells us that there was a bruise at the base of the skull, which may have been caused by a blow from the propeller of a boat. A half-digested haddock and other fish remains were found in the stomach. The Shark was 7 ft. in length and will find a resting-place in the Royal Scottish Museum. The only previous records, we believe, for the occurrence of this species in the Forth are, a note from the "Edinburgh Evening Dispatch" of a Blue Shark 10 ft. long captured on Kinghorn beach on 30th November 1894 (see "A.S.N.H.," 1900, p. 16), and a record by Mr. Evans of one captured in the salmon nets, at Gullane Point, East Lothian, on 7th July 1898 ("A.S.N.H.," 1898, p. 239).—LEONORA JEFFREY RINTOUL and EVELYN V. BAXTER, Largo.

Oligochæta from the Isle of May (Forth).—On 23rd September last, I found a number of Enchytræid worms among earth at the roots of a large tuft of sea-pink (*Armeria maritima*) on the rocks at the south end of the Isle of May. One had all the external appearance of *Enchytræus albidus*, Henle, and so it turned out to be, but the others seemed quite different. On submitting specimens to Mr. R. Southern, he reported, besides *E. albidus*, *Henlea hibernica*, Southern, and *Fridericia bulbosa* (Rosa)—a few of each, and both recorded by him from Ireland, but not from Great Britain, and therefore additions to my "Forth" list ("Proc. Roy. Phys. Soc." xviii. 109).—WILLIAM EVANS, Edinburgh.

BOTANICAL NOTES AND NEWS.

Rhinanthus Perrieri.—In the "Annals," p. 178, 1909, the Rev. E. S. Marshall says he 'thinks "Mr. Druce's contention ["Annals,"

p. 103] is quite arbitrary, and that the original specific name under this genus holds good; though Sterneck, under *Alectorolophus*, was free to choose." I am afraid my friend must have penned this in a hurry and without carefully reading Sterneck's Monograph, p. 109. As I said, when Sterneck was monographing the genus, which I think he wrongly called *Alectorolophus*, and had to decide upon the specific name for the above plant, he deliberately rejected the specific name under *Rhinanthus Perrieri*, "since," he says, "Chabert founded it upon a character common to several if not all the members of the genus *Rhinanthus*."

The Vienna Actes (art. 26, sect. xiv. b) say, "avoid names which express a character common to all or nearly all the species of a genus." Surely, then, if such a name as *Carex triangularis* is inadmissible because it is founded on a character common to most Sedges, the establishment of a species of *Rhinanthus* upon a character of the corolla which is possessed by many if not all *Rhinanthi* is equally prohibited. Chabert himself established *Rhinanthus minor*, var. *rusticulus*, and this had characters which Sterneck thought sufficiently marked to be worth specific rank. It is true in synonymy Sterneck quotes *Rhinanthus Perrieri* under *A. rusticulus*, but he carefully explains why he does not use that name for his species. Moreover, Rouy and Foucaud ("Fl. de Fr.") keep them separate. Mr. Marshall says, "Sterneck had a right to choose" the name he might adopt for a plant when removing it from *Rhinanthus* to *Alectorolophus*. But the Vienna Actes expressly say (art. 48) "the first specific epithet must be retained," if this is removed from one genus to another, assuming there is no similar name extant.

I have recently shown ("Journ. Bot." p. 78, 1910) that botanists are correct in retaining the well-known generic name *Rhinanthus* for the Yellow Rattles. This was founded by Linnæus in the "Species Plantarum," in 1753, was clearly described by Hill ("British Herbal," 1756), and strictly limited by Hudson ("Flora Anglica," 1762), thus distinctly antedating Haller ("Stirpes Helv." p. 137, 1768), who revived *Alectorolophus*, which had been, unjustly, it is true, ignored by Linnæus.—G. CLARIDGE DRUCE.

Phæothamnion confervicolum, Lagerh. New to Britain.—Among some Algæ collected from the Elf Loch on the Braid Hills, Edinburgh, in August 1910, I found some specimens of a brown algæ growing on *Lemna minor* and other aquatic phanerogams. After examination I concluded that this must be *Phæothamnion confervicolum*, Lagerh., first found and described by G. Lagerheim in "Bihang till K. Svenska Vet.-Akad. Handlingar," Bd. 9, No. 19, in 1884, and again in Hansgirg's "Prodromus der Algenflora von Boehmen," 1886, and in De Toni's "Sylloge Algarum," vol. 3 ('Fuco-ideæ'), 1895.

In order to avoid any doubt, I sent specimens to Prof. G. S. West of Birmingham, and he has kindly confirmed the identification. This alga is of special interest to algologists, as it is one of the few Phæophyceæ (or brown algæ) occurring in fresh water.—F. L. MCKEEVER.

Moray Plants.—On 8th June, while examining a rough, boggy patch of ground between the larger sandhills of Culbin and the sea, I noticed several spikes of one of the *Orchidaceæ*. I had not previously seen the plant, but I at once identified it (as *Corallorhiza innata*) from the appearance of the root. Although it is mentioned in Sowerby's "Botany," and also in Watson's "Cybele Britannica," vol. ii., as occurring in Moray, no definite locality is stated, but I presume the term Moray is meant to embrace a much wider stretch of country than to-day falls within the bounds of Morayshire. No mention of the Coral Root is made in Dr. Gordon's "Flora of Moray," and I learned from the Rev. George Birnie of Speymouth that, as I anticipated, it had never been recorded either by Dr. Keith or Dr. Gordon as occurring near Forres.

On 9th July I discovered a new locality for *Pyrola uniflora* in a fir-wood on the hill above Glenburgie Distillery, about three miles east of Forres. The plants, which were very large and handsome, especially in sunken mossy hollows of the wood-floor, were abundant within an area of about half an acre or thereby.—ALEX. MACGREGOR, Forres.

Correction, p. 254, 1909.—Instead of, "and not to *Carex divulsa*, which is under *C. canescens* in the Linnæus herbarium," read, "and not to *Carex divulsa*, which is under *C. loliacea* in the Linnæus Herbarium."

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—October-December 1910.

[The Editors desire assistance to enable them to make this Section as complete as possible. Contributions on the lines indicated will be most acceptable, and will bear the initials of the Contributor. The Editors will have access to the sources of information under mentioned.]

ZOOLOGY.

NOTES ON BIRDS. *The Glasgow Naturalist*, vol. iii. No. 1, Nov. 1910, pp. 32-37. Notes on the Ruff, Jay, Common Guillemot, Storm Petrel, Mealy Redpoll, and Flamingo, and on the Arrival of Summer Visitors in Scotland and the North of England.

WAXWINGS AND BRAMBLINGS IN BERWICKSHIRE. K. Logan Home, *The Field*, 19th Nov. 1910, p. 955. A flock of nearly 200

Bramblings and a single male Waxwing observed at Edrom on 12th Nov.

THE WILLOW-WRENS OF A Lothian Wood. S. E. Brock, *Zoologist*, Nov. 1910, pp. 401-417, and map. A voluminous account of the habits of the birds and distribution of their nests, etc.

GLOSSY IBIS SHOT IN UIST. H. Newton, *The Field*, 10th Dec. 1910, p. 1094. Specimen shot in South Uist in November.

ALBINO RINGED PLOVER IN ORKNEY. J. Gwyn Jeffreys, *The Field*, 17th Sept. 1910, p. 551. A white example obtained at Kirkwall on 20th Aug.

NOTES ON SOME RARE MOLLUSCA FROM THE NORTH SEA AND SHETLAND-FAEROE CHANNEL. James Simpson, *Journ. Conch.*, Oct. 1910, pp. 109-115. One hundred and twelve species recorded.

LAMPRONIA (INCURVARIA) TENUICORNIS, STN., IN INVERNESS-SHIRE. Eustace R. Bankes, *Ent. Mo. Mag.*, Oct. 1910, p. 239. Male taken near Aviemore on 15th June 1909. Reported to be new to Scotland.

ATHETA (HOMALOTA) PICIPENNIS, MANNH., A NEW BRITISH BEETLE. Norman H. Joy, M.R.C.S., F.E.S., *Ent. Mo. Mag.*, Nov. 1910, p. 252. Recorded from Dalwhinnie (one, Sept. 1909) and Aviemore (a few, 10th Sept. 1910).

CRYPTAMORPHA DESJARDINSI, GUÉR., IN GLASGOW. Anderson Fergusson, *Ent. Mo. Mag.*, Oct. 1910, p. 238. Specimen found in house, probably introduced with bananas.

DESCRIPTION OF A NEW SPECIES OF GALERUCELLA. Rev. W. W. Fowler, D.Sc., M.A., F.L.S. *Ent. Mo. Mag.*, Oct. 1910, pp. 228-229. *Galerucella fergussoni*, sp. nov., described from specimens taken at Possil and Frankfield Loch, near Glasgow, by Mr. Anderson Fergusson. [See also *Glasgow Naturalist*, 1910, iii. 36.]

FURTHER CAPTURES OF GALERUCELLA FERGUSSONI, FOWLER. Andrew Adie Dalglish. *Ent. Mo. Mag.*, Nov. 1910, pp. 262-263. Taken at Possil Marsh in 1900 (three specimens) and at Milngavie.

FIELD NOTES ON BRITISH SAWFLIES (*continued*). Claude Morley, F.Z.S., *Entomologist*, October 1910, pp. 281-285. The following Scotch records are given: *Emphytus braccatus*, Taynult (Beaumont); *Taxonos equiseti*, Clunie (Elliott).

TWO DIPTERA NEW TO BRITAIN. D. Sharp, M.A., F.R.S., *Ent. Mo. Mag.*, Dec. 1910, pp. 274-275. *Microdon eggeri* Mik, taken at Rannoch, June 1910; *Ernoneura argus*, Ztt., captured on the shores of Loch Garten, near Nethy Bridge, June or July, and by Col. Verbury in the Thurso district (near Scrabster).

ON THE BRITISH SPECIES OF PHORA. John H. Wood, *Ent. Mo. Mag.*, Oct. and Nov. 1910, pp. 243-249. *Phora hirsuta* recorded from Bonhill on p. 249.

BOTANY.

REPORT OF THE BOTANICAL EXCHANGE CLUB FOR 1909. By the Editor and Distributor, S. H. Bickham, F.L.S., 1910. Several Scotch plants are recorded.

NOTES ON SCOTTISH PLANTS. By C. E. Salmon, F.L.S. (*Journ. Bot.*, 1910, pp. 205-206). A list of plants found, in Sept. 1909, by A. Wallis in Westernness (97), Skye (104), and West Ross (105). Chiefly from Skye, for which there are several new records, also a few for Westernness.

COCHLEARIA MICACEA IN PEEBLESSHIRE. By M^cTaggart Cowan, jun. (*Journ. Bot.*, 1910, p. 334), at 1000 feet, in a mossy spring, on N.E. border.

SPIRÆA ULMARIA, L., VAR. DENUDATA, BËNN. By G. Claridge Druce (*Journ. Bot.*, 1910, pp. 281-283). Discusses the value of this as a variety.

ROSA PIMPINELLIFOLIA, L. × RUBIGINOSA, L. By William Barclay (*Journ. Bot.*, 1910, p. 260). Numerous clumps of this rare hybrid grow along half a mile of coast near Port Seton, some to a height of 8 feet. They bore a fair crop of fruit.

A NEW VARIETY OF ROSA HIBERNICA. By William Barclay (*Journ. Bot.*, 1910, pp. 332-333). Found in Haddington, near Port Seton; referred to *coriifolia* × *pimpinellifolia*, a more or less hairy form.

ARMERIA ALPINA, WILLD., IN BRITAIN?. By H. Stuart Thompson, F.L.S. (*Journ. Bot.*, 1910, pp. 278-279). Questions occurrence of true *A. alpina* in Britain.

JUNCUS TENUIS, WILLD. By C. E. Salmon (*Journ. Bot.*, 1910, p. 259). Enumerates several vice-counties in Scotland. The record "98 Easternness, J. W. H. Traill, 'Ann. S.N.H.', 1907, p. 251," is erroneous, the species there recorded being *J. balticus*.

RUPPIA ROSTELLATA IN V.C. 74. By C. E. Salmon (*Journ. Bot.*, 1910, p. 334). Notes a specimen labelled "Stranraer, Dr. Greville" (already recorded from Stranraer).

COLLODERMA, A NEW GENUS OF MYCETOZOA. By G. Lister, F.R.S. (*Journ. Bot.*, 1910, pp. 310-312). *C. oculatum* (Lippert), G. Lister, found by Rev. W. Cran, in Sept. 1910, on moss and hepatics in two localities in Skene, Aberdeenshire.

BOOK NOTICES.

A HISTORY OF BRITISH MAMMALS. By Gerald E. H. Barrett-Hamilton, B.A., M.R.I.A., F.Z.S. With twenty-seven full-page plates in colour, fifty-four in black and white, and upwards of two hundred and fifty smaller illustrations, drawn by Edward A. Wilson, B.A., M.B. London : Gurney and Jackson, 1910.

By those who are interested in our British mammals, the name of Mr. Barrett-Hamilton has been long regarded, through his numerous and valuable contributions to their study, as the leading authority on their histories. Fortunately he has been induced to write a book giving us the benefit of his great knowledge. We have now the pleasure of noticing the two parts already issued, and these, from their many and outstanding excellences, will assuredly secure for the work the highest place in the estimation of readers, both scientific and general. The author's treatment of his subject is, as we should expect, masterly. Each of the great Orders, under which the various families naturally belong in the modern scheme of classification, are very fully discussed from all standpoints. Then the smaller groups of families and genera, the members of which are more nearly related, are likewise treated of; and the characters of the latter, both morphological and anatomical, are fully described. Then follow the all-important species. Here we have sections devoted to synonymy; local names; distribution, both at home and abroad; distribution in time; period of gestation; number of young; breeding season; description (fur, colour, seasonal changes, skull, teeth, etc.); individual and geographical variation; dimensions; weight; and distinguishing characteristics—all these sections being indicated by the use of heavy type, so that reference can be instantly made to any class of information desired. This we may describe as the scientific side of the histories, and it is followed by a full and readable general account, including habits, life-histories, food, etc. Taking the common Bat (*Pipistrellus pipistrellus*) as an example, some idea of the thorough and exhaustive manner in which each species is treated will be made manifest when we say that twenty-four pages are allocated to its consideration. All the species are treated of in the same philosophic and scientific manner. The work, too, is abundantly illustrated by high-class plates, both coloured and plain, and also by numerous useful figures in the text. A word of praise must be bestowed upon the publishers and printers for their contributions towards the excellence of this valuable book—the best ever written on the engaging histories of our British Mammals. The work is to form three volumes, and is being issued in monthly parts at 2s. 6d. net.

THE EGGS OF THE BIRDS OF EUROPE, INCLUDING ALL THE SPECIES INHABITING THE WESTERN PALÆARCTIC AREA. By H. E. Dresser, F.L.S., F.Z.S., etc. London: 1905-1910. Issued in 24 parts. £12:12s. net.

By the completion of this, the finest and most beautiful work ever published on the subject, ornithologists are once more indebted to Mr. Dresser for a great contribution to their favourite science. These handsome volumes form companions to the same author's great work on the "Birds of Europe." It has been our pleasure from time to time to notice the book during its progress through the press. It is now our greater pleasure to congratulate the veteran author on the completion of his labours. As we have already pointed out, this work possesses one very special and highly important feature, and possesses it alone among the great works devoted to birds' eggs. It has hitherto been the custom to employ an artist to paint the portraits of the eggs to be figured. Now it may seem a strange fact, yet to ornithologists it is a well-known one, that eggs are extremely difficult subjects to successfully portray, and hence most of the plates that have been devoted to them are more or less unsatisfactory, the exceptions being those cases where the author was his own draughtsman. Mr. Dresser has boldly and successfully overcome this difficulty. He has interposed no artist between his subjects and their portraits, but has had all his figures, and they amount to several thousands, reproduced by the three-colour process, *i.e.* direct from the specimens themselves. At first we were not a little sceptical that success could be achieved by such mechanical treatment, but we were mistaken, for the result is really wonderful. The eggs stand out in all their natural rotundity, and are beautiful and faithful in their colour-markings. In all there are 106 plates, and on these the eggs of over 700 species, usually several of each, are admirably depicted, and are masterpieces of the colour-printer's art. The letterpress is suitable and adequate, and affords full information on the breeding range of each species, the situation and structure of the nest, and the number, description, and measurements of the eggs. The volume devoted to the letterpress is admirably illustrated by text-figures—reproductions of photographs of nests *in situ* of many species. We sincerely trust that Mr. Dresser, who has passed the Biblical limit of life, may be spared to lay ornithologists under further obligations from his stores of knowledge. The excellence of his latest work is the best evidence that his days of usefulness have not yet run their course.

THE BIRDS OF DUMFRIESSHIRE: A CONTRIBUTION TO THE FAUNA OF THE SOLWAY AREA. By H. S. Gladstone, M.A., F.Z.S., F.R.S.E., M.B.O.U. With illustrations from photographs. London: Witherby and Co., 1910. 25s. net.

A book which fills a gap in the ornithic survey of Scotland is

always acceptable. Mr. Gladstone's work, however, does more than this, since it is the only one devoted to any portion of the Scottish Solway area, nay more, we have no other book treating on the avifauna of south-western Scotland. Such a contribution is thus of exceptional value. The author has been very thorough in his investigations into the voluminous literature relating to his subject, and with this rich material, supplemented by his own observations, has produced an excellent, readable, and handsome volume of no less than 482 pages. That the avifauna of this part of the Scottish Solway area is a rich one, and includes many rarities, was to be expected, since it has received the attention of such a distinguished resident and indefatigable naturalist as Sir William Jardine in former times, and latterly of our friend and valued contributor Mr. Robert Service. Many others, whose names will be found in the chapter devoted to bibliography, have also contributed materially to the subject. As the result we find that no less than 218 species are natives, annual visitors, or have casually occurred in the county, while 37 others have been doubtfully recorded. These are all treated from the faunistic point of view; but, in addition, much other information of interest is afforded which is likely to be fully appreciated by the many local subscribers to the book. There are excellent chapters devoted to the physical features of the county, migration, local names of species, etc. That the book was a *desideratum* has been more than indicated, and the author has discharged his self-imposed task in a manner that is creditable in the highest degree, and renders the book a valuable contribution to the great series of Scottish faunal works, among which it is in every way worthy of a high place. It is well illustrated, having twenty-four plates of topographical interest, and is also supplied with a good map of the county.

THE BRITISH BIRD-BOOK: AN ACCOUNT OF ALL THE BIRDS, NESTS, AND EGGS FOUND IN THE BRITISH ISLES. Edited by F. B. Kirkman, B.A. (Oxon.). Illustrated by 200 coloured drawings and numerous photographs. London and Edinburgh: T. C. and E. C. Jack, 1910. In 12 sections at 10s. 6d. net.

We have here the beginnings (two sections) of yet another expensive work devoted to British birds: one by an Editor who is assisted by several well-known ornithologists, including Messrs. Bonhote, Jourdain, Pycraft, and Selous. In an elaborate and business-like prospectus, abounding in promises, we are given to understand that practically all the literature, British and Continental, is to be ransacked and laid under contribution; and that in one respect, at least, namely the accounts devoted to habits, the new work is to surpass anything that has hitherto appeared in a British bird-book. The performance, however, is not remarkable when compared with what we were led to anticipate. In a work which is

to cost six guineas, and is the result of so much labour, we should naturally expect that all sections of the subject would receive adequate treatment; yet except the one on habits, the information afforded is not in advance of that to be found in a Manual or a Handbook, though it is sound so far as it goes. This inadequacy is markedly manifest in the portion which deals with the British distribution of the various species—an important subject, and one that has been extremely popular since the day when Gilbert White declared that the natural history of every kingdom and province should have its own monographer. Though so much is claimed for the accounts of habits, we cannot say that we are enamoured with most of them. A few are decidedly good, others smack too much of the artistic writing of the modern journalist, while those of the chief contributor are sadly marred by eccentricities. The plan of the work is unhappy, inasmuch as the accounts of habits are divorced from those treating of the species generally, and are given of the species under groups, such as Finches, etc. We say unhappy, because these descriptions are long (that of the Finches extending to 73 pages), and, as no rubric is used, it entails much loss of time to find the portions relating to any particular species. As regards the coloured pictures, only a few of them, so far, come up to the required modern standard of excellence, and some of them are exceedingly poor. The figures of nests in the text and the general get-up of the book (apart from its awkward size) are all that could be desired.

THE HOME-LIFE OF THE SPOONBILL, THE STORK, AND SOME HERONS. Photographed and described by Bentley Beetham, F.Z.S. London: Witherby and Co. Price 5s.

Last year Mr. Witherby published a charming little book on the Golden Eagle, and this year he has issued a no less delightful companion volume dealing with the home-life of the Spoonbill, White Stork, Common Heron, and Purple Heron. As the letter-press only amounts to 47 pages the chapters are decidedly short, but they are nevertheless full of observations and notes which bring great credit to the author and show him to be a most careful observer of bird life, and one gifted with an endless stock of patience and energy. In order to study the Spoonbill, White Stork, and Purple Heron, Mr. Bentley Beetham visited Holland, and his trips there proved singularly successful, as in each chapter an interesting and graphic account is given of the home-life of these birds. The author is also an expert photographer, and his 32 photographs of the birds in different attitudes and various stages of life are excellent, and have attained to the high-water mark of perfection among bird photographs. The whole get-up of this little volume is most pleasing, and it is to be hoped that it may not be the last of the series.—G. G. M.



The Annals of Scottish Natural History

No. 78]

1911

[APRIL

OBSERVATIONS ON THE ROCK-BREEDING BIRDS OF THE BUTT OF LEWIS, 1910.

By ROBERT CLYNE.

THE sea-board for a couple of miles on the east and west of the extreme Butt is, for the most part, rocky and much indented, but there are small sandy bays on both sides, the resort of shoals of sand-eels and fry, and consequently good feeding ground for birds. The rocks—they can hardly be termed cliffs—range from 60 to 90 feet in height; are very much fissured and cleft, with fallen portions overlapping each other. There are also several detached skerries, a few yards from the mainland, which cannot be reached without a boat. There is therefore no lack of convenient corners for the different birds which come to breed. These are Shags, Herring and Lesser Blackbacked Gulls, Kittiwakes, Terns, Black Guillemots, Rock-Pigeons, Grey Crows, Starlings, and Common Sparrows. To these may be added a few pairs of Eiders, Sheldrakes, and Oyster-catchers, which are frequently seen though their nests have not been found; Ring-Plover, which breed in the vicinity of the rocks, and Shearwaters and Petrels, which are seen every year at breeding time.

Hundreds of Shags nest in our given area, many in caves out of view of observers. Early in April they were occasionally observed hobbling about in unusual quarters

picking up material for their nests. This year several birds added long rushes which had been found floating in the vicinity of the seaweed of which their nests were composed. Birds were seen apparently sitting on 17th April, but the first squabs of the season were not seen until 7th June. These, three in number, were in an old-established habitation, an overhung ledge in the inner corner of a large gully. There is a nest here every year quite open to observation, and the parent Shags are not afraid to visit their abode though one is near.

The young Shags left the nest on 17th July. Of several later broods which were under observation, the last left the nest about the 20th August.

The Herring Gulls breed in colonies on the outlying rocks, but singly, or only a few pairs together. In other parts there are not over a dozen pairs of the Lesser Black-backed species breeding in our area, and they keep to the outlying rocks. The first Gull eggs were seen on 22nd May, and the first young chicks on 10th June. Unlike the Shags the parent Gulls would not visit their nests when any one was near, but flew, screaming menacingly overhead, the swoop of their wings being felt fanning the face as they passed. Where the young have room to move about they do not remain over a week in the nest. When approached the chicks endeavour to get out of sight by backing one on top of the other in a crevice of the rock, or creeping under stones, and, if handled, eject the fishy food recently swallowed. When older they scream and are ready to defend themselves to the best of their ability. Many of the young seem very reluctant to take to the air or the water, and were often seen partly flying or exercising their pinions before venturing forth. These no doubt had been well provided with food, and were not forced out to forage for themselves. Most of the young "Scories"¹ were, however, on the wing by the middle of August, but several have experienced hard times, and have been seen in the adjoining pasture land persistently following the old birds, and even

¹ [*Local name*, very generally given to the young Herring Gulls so soon as they are able to fly. Coasts of Scotland but recently local to the eastern seaboard.—J.A.H.-B.]

hungrily claiming parentage of the white Wyandotte pullets in the poultry-runs.

In my opinion there are no British birds so elegantly plumaged, so cleanly spick and span, as are the Kittiwake Gulls, and they may well be chosen as emblems of purity. They were first seen at their breeding cliffs on 17th April, and began nest-building about the middle of May. Here they land in two colonies not far apart. The first young were seen on 2nd July; a few were on wing on 8th August; on 28th there were still some late ones in the nests. Before flying they also are seen violently exercising their wings, but on their narrow nesting ledges they have comparatively little room for the operation. In a convenient niche in the centre of the largest colony, a brood of three Shags has been reared. One unlucky pair of Kittiwakes had their nest on the same ledge, only a foot or so from the recess of the Shags. One day I observed a Shag attack one of the parent Kittiwakes, and hold it (struggling, over the ledge) by one wing. As there was only one chick, instead of the usual three, one feels suspicious that Mr. Shag had at some evil moment pushed the other eggs or chicks out of his way, though latterly the young Shags and single Kitty have fraternised and fledged together.

Terns were first seen on 19th May. About forty pairs bred on an outlying rock, and were unmolested this year. Young were seen on 3rd July, and they all left their breeding rock on 7th August, and frequented the adjoining sandy beaches. In rain and haze on the morning of 12th August, five were flying in the rays of the light; and on 15th a young one was picked up in a dying condition, a quill feather about seven inches long being fixed in its throat.

Black Guillemots or Tysties returned to the rocks in early March, and gradually increased in numbers as the weather improved, and the sea got smoother, for they do not care to remain near the rocks when a surf is breaking. They seemed more numerous than in previous years, and bred all along the rocks, even where they were not over twenty feet in height. The Tysties are late breeders here, and young were not seen until 10th July, and one grey chick was still in the nesting cleft on 25th August. It is

stated that the Tystie—unlike the Common Guillemot—deposits two or three eggs. In a cleft of the rock I could see five single eggs, and later single chicks, and conclude they were the offspring of ten different parents. As soon as the young are able to reach the sea they and the parents leave the vicinity of the rocks. Where a few weeks earlier it was common to see twenty or thirty old birds, by the end of August only a single one was seen. On the water Black Guillemots have a peculiar trait of “lining up”¹ in straight lines, and are never (for any length of time) scattered singly here and there. Their rapid flight, and beat of the white-banded wings as they fly from rock to rock, very much resembles that of a large butterfly, while, if alarmed, they will sit at their nesting-hole mewing like a young kitten.

Rock-Pigeons inhabit the caves in hundreds all the year round. There are several very large white birds seen among them, probably tame birds which have associated with the blues, though there are no dovecots in the neighbourhood. In April they may be seen plucking and carrying the succulent green shoots of rock plants, which one would think are more of an edible than a nest-building material. A young nearly full-fledged bird, with downy feathers still attached, was seen early in August. This, I presume, had been a bird of the second or third brood of the year.

One pair of Hooded Crows has nested on the most inaccessible peak for the last three years, and have always managed to rear a brood, though, on account of their depredations among lambs and poultry, the population have been up in arms against these grey marauders.

Several scores of Starlings begin to nest in March, and as late broods took wing in September, some of them at least must rear two broods in the season. They nest in, and occupy at night for shelter, the same clefts of rock as do Tysties, with which they seem to live on the best of terms. A few common Sparrows also breed on rocks near the dwelling-houses. These were feeding a fledged brood in

¹ [A trait in their behaviour curiously enough not remembered by me. I have rarely if *ever* (?) seen them except singly, in pairs, or perhaps triplets. Though I have seen quite a colony of 100 pairs.—J.A.H.-B.]

May, and at the same time collecting feathers for a second nest.

Ring-Plovers breed at several places in our area. One nest was found on pasture land about 400 yards from the shore on 24th May. It then contained three eggs, another was deposited later, and the first chick was seen partly out of the egg on the evening of the 19th June, and by next forenoon they had all scuttled out of sight. We knew from the excited proceedings of the parent birds that the young were safe in the vicinity, but a search among the pebbles where they were hiding was unsuccessful. Nests of the Eiders, Sheldrakes, and Oyster-catchers I have not found, but as a few pairs frequent the fringe of low-lying rocks at the extreme S.W. of our area,¹ and are usually seen with a following in the autumn, we may safely include them among our shore breeders.

Petrels are caught every year on the lantern during the breeding season. On the morning of 12th August a Manx Shearwater struck the lantern heavily and was killed. Searchings in likely places, and frequent watching in the gloamings have, as yet, failed to locate a nesting place, though I am convinced this species breeds somewhere near.

Common Guillemots and Puffins were seen resting on the rocks this summer. Flocks of them, and also Razorbills, are often seen passing, but none of them breed. I have not observed Cormorants breeding here though a few are seen during the winter.

Gannets never rest here. They pass in thousands from March to October. One can understand the passing S.W. in spring of continuous flocks when they are probably resorting to their usual breeding haunts, but why the majority should pass daily in a S.W. direction during the summer is a puzzling question, which I would like more particularly to study another year.² Evidently they must make a circular tour, when coming to the Minch to fish, going empty through the Sounds and coming up the Minch replete.

¹ ["Area" not defined, I think.—J.A.H.-B.]

² [Following the herrings, and *then* the mackerel "schools." Gannets return W. to E. through the Pentland Firth and follow the herring, or go to meet the herrings in Shetland. See earlier Migration Reports.—J.A.H.-B.]

Rarely a few are seen cutting the point and sailing overland, but a channel between an outlying rock and the mainland at the extreme Butt is their favourite highway, and probably has been from time immemorial.

THE LIGHTHOUSE, BUTT OF LEWIS.

BLYTH'S REED - WARBLER (*ACROCEPHALUS DUMETORUM*) AT FAIR ISLE: AN ADDITION TO THE BRITISH AVIFAUNA.

By WM. EAGLE CLARKE.

IN September last, a small plain-coloured bird resembling a Garden-Warbler in colour was observed by Her Grace the Duchess of Bedford in a small plot of turnips at Fair Isle. It was very shy, and only afforded a momentary view ere it sought fresh cover. It was found by my observer in the same place on the following day, and after some trouble was secured, and believed by its captor to be a Reed-Warbler.

On receiving the skin I found that it was not a specimen of the common Reed-Warbler, and on further examination along with Dr. C. B. Ticehurst we made it out to be *Acrocephalus dumetorum*. Not having any specimens of this species with which to compare it, I sent the bird to Dr. Hartert, who kindly confirmed the identification.

Blyth's Reed-Warbler is not only an addition to the British avifauna, but is a new bird for Western Europe, for it has not, I believe, been found farther west than Russia. It is a summer visitor to regions from the Governments of St. Petersburg and Archangel eastwards to the valley of the Yenesei, and southwards to Transcaspia, the Himalayas, Altai, and Turkestan. The winter is passed in the plains of India from the foot of the great mountains of the north to Ceylon, and from Sind to Assam. Its habits are said to be less aquatic than those of its allies, since it frequents low jungle where rushes flourish, as well as reeds and trees overhanging water, and occurs at altitudes of 6000 feet or more.

In colour it more resembles the Marsh-Warbler (*A. palustris*) than the Reed-Warbler (*A. streperus*), but is a little duller in colour and usually smaller in size, though the smallest Marsh-Warbler and the largest *dumetorum* overlap. The wing formula of Blyth's bird differs from both the British species just mentioned in having the second primary shorter than the fifth.

ON THE OCCURRENCE OF TEMMINCK'S GRASSHOPPER-WARBLER IN ORKNEY.

By WM. EAGLE CLARKE.

I RECEIVED a specimen of this interesting bird from the Pentland Skerries, where it was captured on 26th October 1910. The bird rose, on being disturbed, and darted into an old rabbit's burrow, from which it was taken and sent to me in the flesh for identification, and proved to be *Locustella lanceolata* of Temminck. It is a new bird to Scotland, and has only twice previously been recorded for Western Europe, namely at North Cotes in Lincolnshire on 18th November 1909; and at Heligoland on 13th October 1909. I am now convinced, however, that a bird I shot at Fair Isle on 9th September 1908 is a young bird of this species—a view that is also shared by my friend Dr. C. B. Ticehurst, who has seen the specimen and compared it with other members of the genus.

This species is a summer visitor to the whole of Siberia and the northern Isles of Japan, but is of very rare occurrence in European Russia. Its winter quarters are in Burmah, India, South China, and Borneo. This eastern bird resembles our Grasshopper-Warbler, but, as a rule, it is a little smaller, and has the dark spots on the centre of the feathers of the upper plumage more clearly defined. The Orkney specimen, which is a bird of the year, has the under parts greyish yellow with dark brown streaks on the centre of the feathers of the throat and breast.

SCOTTISH HERONRIES AND A CENSUS OF HERONS.

By HUGH BOYD WATT, M.B.O.U.

THE full and careful account of Heronries in the "Dee" area by Mr. A. Landsborough Thomson in the last number of the "Annals" (pp. 7-9), enables another extensive district to be added to those which have been reported upon, in detail, within recent years. Those districts, and the works containing statistical and other information on the Heronries within their bounds, are as follows (in chronological order):—

1. BERWICKSHIRE AND THE BORDERS.—See 'Heronries and Border Heronries,' by James Smail ("Hist. Ber. Nat. Club," vol. x. pp. 330-4, 1885); and the "Birds of Berwickshire," vol. ii. 1895, by George Muirhead.
2. "CLYDE" AREA.—See 'Heronries, Past and Present, in the Clyde Faunal Area,' by Hugh Boyd Watt ("Trans. Nat. Hist. Soc., Glas.," vol. v. (new series, 1900), pp. 378-90.
3. "FORTH" AREA.—See 'Heronries in Forth,' by William Evans' ("Ann. Scot. Nat. Hist.," 1909, p. 116). A brief note only.
4. DUMFRIESSHIRE.—See the "Birds of Dumfriesshire," 1910, pp. 228-30, by Hugh S. Gladstone (*ut infra*).
5. "DEE" AREA.—See 'Heronries in Dee, etc.,' by A. Landsborough Thomson ("Ann. Scot. Nat. Hist.," 1911, pp. 7-9).

For additional information see under "Clyde," "Forth," and "Dee" below.

If a bibliography of Scottish Heronries was being attempted many other items would be included; but it may be remarked here that the principal works of a more general scope were mentioned in the introduction to my first list ("Ann. Scot. Nat. Hist." 1908, p. 219), not omitting the important publications named in the editorial comments in the current "Annals" (p. 9). It seems incredible that Mr. Harvie-Brown's works can be unknown to any one interested in the history of Scottish birds.

Since my last communication ("Ann. Scot. Nat. Hist.," 1910, pp. 68-70) further information has been gathered, which is now appended in the form of a

SECOND SUPPLEMENTARY LIST OF HERONRIES.

(* = Extinct.)

MORAY.

Castle Stuart, Inverness, scattered nests in the woods.

*Darnaway, should have been marked as extinct. Abandoned about 1873.

Munlochy, Black Isle, but no information as to numbers.

DEE.

*Crathes, about 1902, not more than one nest.—Mr. A. M'Donald, Durris.

For list of other places, see Mr. A. Landsborough Thomson's article cited above; but note that Leithhall, Kennethmont, should not be included under "Dee." It is in "Moray," and is correctly entered in my first list ("Annals," 1908, p. 220).

Netherdale (River Deveron). To prevent any confusion it might have been well had Mr. Harvie-Brown added to his remarks that this is in "Moray," not "Dee." It is named in my first list (*loc. cit.*).

TAY.

*(?) Ardoch (on the Knaick), several nests; may be there yet, but my informant has not seen the place for about forty years.—Dr. Geo. Hunter.

FORTH.

Saltoun Wood, 6 or 7 pairs; 2 or 3 pairs came from Tynninghame 12 or 15 years ago and then nested at the waterside (Tyne); later on they moved up to their present position.—Mr. John Laidlaw.

TWEED.

Carolside (on the Leader), a large Heronry.—"Hist. Ber. Nat. Club," vol. xx. p. 319 (1910).

Dawyck, ought not to be marked * as extinct; 12 or 15 nests are tenanted in the breeding season. It is gratifying to know of the continued existence of this old and historical Heronry. "Dawik" or "Dawikkis" supplied "quyk herounis" to the King so far back as 1497, according to the "Accounts of the Lord High Treasurer." For the above and other information my thanks are due to Mr. W. Balfour Gourlay.

ARGYLL AND THE INNER HEBRIDES.

Ardgour House, small, in 1887-8, "and may be used still."—W. I. Beaumont ("Ann. Scot. Nat. Hist.," 1910, p. 183).

CLYDE.

Doonside House, marked * in original list. Added again to nesting sites ("Annals Kilmarnock Glenfield Ramblers' Soc." No. 6, 1907-10).

*Garelochhead, occasional nests, but not since 1905.—W. R. Baxter ("Glasgow Nat.," 1910, p. 76).

Loch Long, several single nests at various places on both sides, between Portincaple and Arrochar.—W. R. Baxter, *ut supra*.

Loudoun Woods, added to nesting sites ("Annals Kilmarnock," *ut supra*).

Martnaham Loch, a strong colony now and last year.—Mr. John Smith, Dalry, Ayrshire.

Muirkirk (near), pair nested and reared young in 1908 ("Annals Kilmarnock," *ut supra*).

SOLWAY.

From Mr. Hugh S. Gladstone's work cited above, the under-named should be marked as extinct, in my first list:—

*Brunt Fir Wood.	*Jardine Hall.	*Shaw, Dryffe Water.
*Castle Milk.	*Monaive, Dalwhat Water.	

On the same authority additional places have to be included in the list as follows:—

*Arkleton, Ewes, at one time 20 nests (abandoned).

Auchanhessnane, Tynron, 3 to 6 nests.

*Auchenaught, Penpont, one or two pairs used to nest (abandoned).

*Barbuie, Glencairn, one nest some years ago (abandoned).

*Beardie's Howe, Closeburn, left when trees cut down in 1890 or 1892 (abandoned).

.Crurie, Eskdalemuir, 12 nests in 1908.

*Dabton, Morton, a tree regularly resorted to (abandoned).

*Dean Bank, Ewes, formerly two nests (abandoned).

*Dormont, Dalton, seen 1865 (abandoned).

*Drumlanrig, Durisdeer, at one time 6 nests (abandoned).

Duncow, Kirkmahoe, only a few.

*Eliock, Sanquhar, till about 1888 (abandoned).

Flaskwood, Langholm, 12 nests in 1908.

Glenmaddie, Sanquhar, 2 nests; came about 1903.

Hillhouse Plantation, Kirkpatrick-Juxta, never more than two nests.

Hollee Wood, Kirkpatrick-Fleming, usually two nests; since about 1900.

Kirkwood, Dalton, 4 nests in 1908.

Libby Moor Plantation, Kirkconnel, usually 4 or 5 nests.

Mount Annan, Annan, since the memory of man. Sometimes 3 nests, usually one.

*Murtha, Kirkpatrick-Juxta, nested for at least 80 years, left in 1907 (abandoned).

Nether Lochar Woods, Ruthwell, 3 pairs since 1905.

*Nithbank, Morton, 7 or 8 nests in 1883; trees blown down 1884 (abandoned).

Shaw Wood, Glencairn, 2 or 3 nests for many years.

Woodcockair, Annan, 4 nests in 1907; usually one or two.

All the information gathered points to the continued abandonment of the habit of nesting in large colonies or to their break-up in Scotland, very few places now having more than twelve nests together. The number of single nests occurring may also be remarked on. Mr. Dresser ("Birds of Europe," vol. iv.) says "now and then a solitary nest is to be found," but in Scotland at the present day such nests are not infrequent.

A CENSUS OF HERONS.

From the foregoing it will be seen that already the Heronries of a considerable portion of Scotland are well and accurately determined, and a sound basis laid for attempting a census of the species, if the suggestions made in the last number of the "Annals" (pp. 8-10), are thought to be practicable and useful. The sedentary habits of the bird and its large size are considerations in favour of the project. In the Reports on Scottish Ornithology published in the "Annals" (1893-1910), Herons are very seldom mentioned, only seven of the years having any entries and these quite brief. The difficulty, however, of anything approaching a definite and simultaneous census of the whole of Scotland, or indeed of any one of the faunal areas, seems to be considerable. To test the matter, I would suggest that the observers and recorders who make returns for the annual Reports should have a supplementary schedule sent them with directions for a census of Herons in their districts. The schedules could also be sent to others likely to be able to make returns, including the subscribers to the "Annals," with a request for their assistance. Directions might be given fixing a day or days for taking the census, which should be simultaneous or as nearly so as possible. Three enumerations at different periods of the year (say the first Saturday in the months of March, June, and October or November) might be aimed at, and a mean of the returns worked out, thus reducing errors. The supplementary schedule should also have columns for statistics of present nesting places.

The conduct of the census and subsequent report might, I venture to suggest, be placed with confidence in the hands of the writers of the last Report on Scottish Ornithology who are already in touch with observers and recorders throughout the country. If Miss Evelyn V. Baxter and Miss Leonora Jeffrey Rintoul will undertake this, Scottish ornithologists will look forward to obtaining as satisfactory a result as is possible.

SOLAMOSSE GEESE.

By J. H. GURNEY, F.L.S., F.Z.S., etc.

THE Household Books of Lord William Howard of Naworth Castle in Cumberland, known in Border traditions as "Belted Will," having been submitted to the Surtees Society, a liberal selection from them was published in 1877 (68), under the editorship of the Rev. George Ornsby, in which there are several entries about birds.

Under date of 14th August 1623 we read of the following payment :—

To the Lord Crainston's man bringing iiij Solamosse geese, iij^s, iiij^s.
and a month later,—

18th Sept. To Mr. Albany Fetherstone's man bringing iiij live partridges, xij^d.

And again, on 23rd August 1633,—

To 2 boyes bringinge 10 Sollemgeese from my Lord Cranston, x^s.

To the first of these passages the editor, Mr. Ornsby, appends a note saying that the Gannet or Solan Goose is the bird meant; but this appears doubtful, from what Mr. H. S. Gladstone has recently told me.

Mr. Gladstone finds the Solway Firth spelled in some old MSS. thus—"Sollan Moss," and in another place "Solon Moss;" and also "Sollan" in an old map of Cumberland. This naturally leads to the conclusion that the Geese brought into Naworth Castle were not Gannets but Grey Geese of some sort from the Solway. Solway Moss, which lies at the mouth of the river Esk, is only five miles from Naworth Castle, but as to whether Geese are still found there, I have no information.

As they were sent by Lord Crainston in August, they may have been domestic Geese, which is all the more possible, as "willd gesse" and "wilde gouse" are elsewhere particularised in the Naworth accounts; Wild Geese would hardly have been obtainable so early in the autumn as August.

In the second passage the word is different, the spelling

being "Sollemgeese," which is practically the same word used for the Gannet by Sir William Brereton in 1635;¹ accordingly, it is not unlikely that real Gannets are intended, and the date, 23rd August, would be about the time for taking them at the Bass Rock, distant from Naworth, as the crow flies, about sixty miles, and not a great deal longer by road. At the Bass the young Gannets were harvested every year, and looked upon as a delicacy. To so great an extent was this carried on, that Brereton tells us in his time the fowl taken on the Bass were worth £200 a year.

KESWICK HALL, NORWICH.

ON SOME AMBICOLOURED FLAT-FISH FROM THE CLYDE.

By RICHARD ELMHIRST, F.L.S.

Superintendent of the Marine Biological Station, Millport.

IN October 1908 Mr. J. N. Goudie, of Strone, sent to the Millport Marine Station an ambicoloured Dab which he had caught on a hand-line, in about 4 fathoms, in the Holy Loch. I heartily thank him for sending this interesting specimen to this station. I have found the blind side partly coloured in a few other fishes.

PLAICE (*Pleuronectes platessa*, L.).—One specimen, 143 mm. long, from Fairlie Sands had the posterior half pigmented and spotted, followed by three round patches of pigment in a transverse row, and one patch still further forward. The orange marks on the left side were exactly opposite the normal marks on the right, as in the case of symmetrical colour variation mentioned by Bateson in "Materials for the Study of Variation," p. 467, except for a little extra coloration about the lateral line on the left side. The anterior termination of the dorsal fin is normal, not ending behind the eyes, as in a specimen mentioned by Cunningham and M'Munn in "Trans. Roy. Soc." vol. 184, p. 802.

¹ "Travels in Holland, the United Provinces, England, Scotland, and Ireland," MDCXXXIV-MDCXXXV. By Sir William Brereton, Bart. Edited by Edward Hawkins (1844).

In Rothesay Museum there is a cast of a specimen caught locally in which the posterior quarter of the body was almost white on the right side. The anterior $\frac{3}{4}$ was normal in colour as also was the tail; on the blind side the distribution of the pigment, including the red spots, was similar to and symmetrical with the right, only much darker. The dorsal fin in the cast ends over the origin of the pectoral, not reaching near the head, which is $4\frac{1}{6}$ in the length (normal $4\frac{1}{3}$).

WITCH (*P. cynoglossus*, L.).—The presence of chromatophores scattered over the left side—about 50 per sq. cm.—seems to be a normal condition.

DAB (*P. limanda*, L.).—(1) The specimen caught by Mr. Goudie is 171 mm. long, completely pigmented on both sides, and in general appearance rather short and stumpy, particularly about the head.

The head is distinctly short, 5.3 in the length, instead of $4\frac{3}{4}$ to 5, as given by Day in "British Fishes," vol. ii. p. 32. The dorsal fin ends anteriorly in a hook, as is common in ambicoloured flat-fish. The end of the hook, instead of projecting above the eyes, is bent down close to the edge of the left eye, which it touches. This makes it look from the right as though the dorsal fin ended behind the left eye without a notch; the notch only shows distinctly from the left side. The left eye is placed almost on the top of the head. On the left side there is a depression in the operculum, the region of the preopercular bone being distinctly concave. The fin formula is—D. 75, P. 10, V. 6, A. 55, C. 15, *i.e.* one extra ray in the caudal fin.

(2) 200 mm. long, slightly coloured on the left pectoral and ventral, the angle between the ventral margin, from the chin to ventrals, and the gill cleft being fully pigmented.

(3) 160 mm. long, has a slight patch on the left operculum and a few chromatophores scattered over the body.

(4) 112 mm. long, has a patch on the operculum and a streak 3 mm. wide crossing half-way from the middle of the dorsal fin to the middle of the anal fin. Also a few chromatophores near the base of the dorsal fin posteriorly.

FLOUNDER (*P. flesus*, L.).—There is a fully ambicoloured specimen which has been in the station for some years, 310 mm., head rather longer than normal, 3.8 instead of 4 in the length. The anterior end of dorsal fin ends in a free hook which hardly reaches to the posterior edge of the left eye as in that figured by Cunningham and M'Munn, *l.c.* pl. 54, fig. 2, where it overlaps the left eye. Left eye is on the top of the head.

In October Messrs. M'Neil, Millport, took a flounder on Fairlie Sands which was ambicoloured and had the head to the

left. Mr. J. Thorburn tells me about one in fifteen are left-handed.

Locally the Flounder is called a "Mole," and Plaice called Flounder.

TURBOT (*Bothus maximus*, L.).—In May 1908 Mr. T. Thorburn caught and presented to Rothesay Museum an ambicoloured Turbot, $18\frac{1}{2}$ ins. long, of which there are three casts exhibited. The head is $3\frac{3}{4}$ in the length (normal $3\frac{1}{2}$). There is a deep notch over the eyes, which are above each other (cf. J. Ritchie, "A.S.N.H." No. 67, p. 146); the free end of the dorsal fin reaches to about half-way between the eyes and the anterior extremity. The right eye is practically on the top of the head. The long tubercles are present on both sides of the body.

I am indebted to the courtesy of Mr. Herd for the privilege of examining these casts, the originals of which have unfortunately not been kept. Since writing the above notes I have met with several cases of partial ambicoloration in Plaice and Dabs.

A LIST OF SPIDERS COLLECTED AT FORRES ("MORAY") IN AUGUST 1910.

By the Rev. J. E. HULL, M.A.

[*Note by* W. EVANS.—The following list of Spiders from the neighbourhood of Forres has been sent to me by the Rev. J. E. Hull, Ninebanks Vicarage, Northumberland, to use as I please. There are none too many records of Spiders from Scotland, and I think the list ought certainly to be published in full in our "Annals of Scottish Natural History." The pages of the magazine already contain several lists of Spiders from various parts of Scotland, including one in the volume for 1894 based on a collection made by me in the Aviemore district of "Moray." Six of the species recorded by Mr. Hull from Forres are, so far as I am aware, new to the Scottish list (they are marked by an asterisk), while a number of others have not previously been reported from the North of Scotland.]



Having received *Bolyphantes expunctus*, Cb., from the neighbourhood of Forres in 1908, I spent four days in that district in August 1910, for the express purpose of extending my acquaintance with that Spider. Though August is comparatively a dead month for Spiders, the number of species taken was unexpectedly large. With the assistance of Mr. J. W. H. Harrison of Middlesborough, I collected in that brief time the species enumerated below.

Of these the most notable capture was a new *Lycosa* taken by Mr. Harrison in the pine woods of Altyre. This I am describing in the forthcoming Trans. of the "Northumberland and Durham Nat. Hist. Soc.," under the name of *Lycosa harrisonii*. Next in importance was *Cnephalocotes ambiguus*, Cb., which was plentiful on the mud-flats on the southern shore of Findhorn Bay. Of this the only previously known example was the type male from the Firth of Clyde;¹ the female was therefore new. I have handed it over to Mr. Pickard Cambridge, who will describe it in a forthcoming paper. *Agyneta mystica*, Cb., until the present year (1910) was represented only by the type female from Balmoral. In the spring I was fortunate enough to take both sexes in Allendale, Northumberland. The present, therefore, is the third record, and the second for Scotland. *Cnephalocotes incurvatus*, Cb., is in much the same position. For many years the type male from near Aberdeen remained unique. Two years ago I took two more examples of the same sex, on the Northumbrian coast, but in July 1910, a female was sent to me from the same locality which I take to be the missing female of that species. This is the spider which turned up at the Findhorn sandhills and is recorded below as *Cnephalocotes incurvatus*, Cb.

Another interesting find was *Lycosa postuma*, Cb. Hitherto the type female from Balmoral was unique. It was in bad condition and was recorded by Mr. Pickard Cambridge as a *Trochosa*. It is, however, certainly a *Lycosa* closely allied to *L. amentata*, Sund. Mr. Pickard Cambridge, to whom I have sent the example taken on the Culbin Sands, will publish presently a supplementary description.

¹ [It was taken by me in Arran—not Bute as stated by the describer—in April 1895.—W.E.]

LIST OF SPECIES.

A. = Altyre Woods. C. = Culbin Sands and W. side of Findhorn River. F. = Findhorn Sandhills and E. bank of Findhorn River. D. = Lochan Dorb.—Species common to all four, without letters. Species not previously recorded from Scotland, marked with an asterisk.

- Oonops pulcher*, Temp., ♂ ♀, A.
Drassus lapidosus, Walck., ♀.
D. troglodytes, Koch, immature.
Micaria pulicaria, Sund., ♀,
 C.F.
Clubiona reclusa, Cb., ♀, C.
C. neglecta, Cb., ♀, C.
C. grisea, L.K., ♀, C.
C. trivialis, L.K., ♂ ♀.
C. diversa, Cb., ♂ ♀, A.
C. comta, Koch, ♀, A.
Zora nemoralis, Bl., ♂ ♀, C.
Scotina gracilipes, Bl., ♀, C.
Dictyna arundinacea, L., imm.
D. arenicola, Cb., F., imm.
Amaurobius fenestralis, Str., ♂ ♀.
Cryphæa silvicola, Koch, ♀,
 A.D.
Tegenaria derhamii, Scop., Forres.
Antistea elegans, Koch, ♂ ♀, C.
Hahnina montana, Bl., ♂ ♀, A.D.
Theridion sisyphium, Clk., ♀, C.
Th. denticulatum, Wk., ♀, A.
Th. bimaculatum, L., ♀, C.
Pholcomma gibbum, Westr., ♂
 ♀, A.D.
Phyllonethis lineata, Clk., ♀,
 C.F.A.
Robertus lividus, Bl., ♀.
R. arundineti, Cb., ♂, C.
Agyneta mystica, Cb., ♀, C.
A. cauta, Cb., ♀, C.
Centromerus bicolor, Bl., imm.
C. concinnus, Thor., imm.
C. prudens, Cb., ♀, D.
Bathyphantes nigrinus, Bl., ♂, C.
B. gracilis, Bl., ♀, C.A.
Porrhomma pygmaeum, Bl., ♀, A.
**Lepthyphantes mengii*, Kulcz.,
 ♂ ♀, A.
L. ericeus, Bl., ♂ ♀.
L. cristatus, Menge, ♀, A.
L. blackwallii, Kulcz., ♂ ♀, A.
L. alacris, Bl., ♂ ♀, A.D.
L. minutus, Bl., ♂ ♀, A.
Labulla thoracica, Wid., ♂ ♀,
 A.D.
Stemonyphantes lineatus, L., ♀,
 A.
Bolyphantes alticeps, Bl., ♂ ♀,
 A.D.
B. luteolus, Bl., imm.
B. expunctus, Cb., ♂ ♀, A.
Linyphia triangularis, Clk., ♂
 ♀.
L. peltata, Wid., ♂ ♀, C.A.
L. hortensis, Sund., ♀, C.
Helophora insignis, Bl., ♂ ♀, D.
Tapinopa longidens, Wid., ♀.
Drapetisca socialis, Sund., ♂ ♀,
 A.
Peciloneta variegata, Bl., ♀,
 F.D.
Mengia scopigera, Grube, ♂ ♀, C.
**Oreonetides firmus*, Cb., ♀, C.
Hilaira frigida, Thor. (= *montigena*, Cb., *nec* L. Koch),
 ♀, D.
Leptothrix hardii, Bl., imm.,
 C.F.
Macrargus rufus, Wid., ♀, D.
Sintula cornigera, Bl., ♀, C.

- Ædothorax fusca*, Bl., ♂ ♀, C.
Æ. retusa, Westr., ♀, C.
Gongylidium rufipes, Sund., ♂, C.
Erigone longipalpis, Sund., ♂ ♀, F.
E. dentipalpis, Wid., ♂ ♀, C.
E. atra, Bl. var. *lantosquensis*, Sim., ♂ ♀, C.
Gonatium rubens, Bl., ♂ ♀.
G. rubellum, Bl., ♂, D.
Neriene bituberculata, Wid., ♀, C.F.
Tiso vagans, Bl., ♀, F.
Savignia frontata, Bl., ♀, F.
**Gongylidiellum vivum*, Cb., ♀, F.
Troxochrus hiemalis, Bl., ♀, C.
T. scabriculus, Westr., ♂ ♀, F.
**Diplocephalus castaneipes*, Sim., ♀, D.
Tapinocyba exilis, Bl. (= *pallens* Cb.), ♀, A.
Peponocranium ludicrum, Bl., ♀, C.F.
Pocadicnemis pumila, Bl., ♀, C.
Minyriolus pusillus, Wid., ♂ ♀.
Cnephralocotes obscurus, Bl., ♂ ♀, C.
C. incurvatus, Cb., ♀, F.
C. curtus, Sim., ♀, F.
C. ambiguus, Cb., ♂ ♀, F.
Ceratinella brevis, Wid., ♂ ♀.
Wideria antica, Bl., ♂ ♀, C.F.
Walckenaëria acuminata, Bl., ♀, A.
W. nudipalpis, Westr., ♀, D.
Ero furcata, Vill., ♀, C.
Pachygnatha degeerii, Sund., ♀, A.
P. clerckii, Sund., ♀, C.
Meta segmentata, Clk., ♂ ♀.
- M. merianæ*, Scop., ♂ ♀.
Zilla atrica, Koch, ♂ ♀.
Cyclosa conica, Pall., imm.
Epeira diademata, Clk., ♂ ♀.
E. quadrata, Clk., ♂ ♀, C.F.A.
E. cornuta, Clk., ♀, C.
**E. patagiata*, Koch, ♀, C.
E. cucurbitina, Clk., ♀, C.
Xysticus cristatus, Clk., ♀.
X. sabulosus, Hahn, ♀, C.
Philodromus aureolus, Clk., ♀, C.
Tibellus oblongus, Walck., C.F., imm.
Pisaura mirabilis, Clk., ♀, C.A.
Pirata piraticus, Clk., ♀, C.
Trochosa terricola, Thor., C., imm.
T. picta, Hahn., ♂ ♀, C.F.
Tarentula barbipes, Sund. (= *andrenivora*, auctt. Britt.), C.F., imm.
T. pulverulenta, Clk., imm.
Lycosa amentata, Clk., ♀, C.F.
L. postuma, Cb., ♀, C.
L. pullata, Clk., ♂ ♀, C.
**L. sp. nov.*, ♀, A.
L. herbigrada, Bl., ♀, C.
L. palustris, L., ♀, C.
L. agricola, Thor. ♀, C.
L. arenicola, Cb., ♀, C.F.
Heliophanus flavipes, Koch, ♀, F.
Neon reticulatus, Bl., ♀, A.
 An immature *Prosthesima* (C.F.) was almost certainly *nigrita*, Fab. (= *pusilla*, Bl.), and a young *Epeira* (A.), in all probability *E. agalena*, Bl., but I have not ventured to include these.

ON SOME NEW AND RARE SCOTTISH
DIPTERA.

BY A. E. J. CARTER.

As our knowledge of Scottish Diptera is but of a scanty nature I make no apology for publishing the following notes on species I have recently identified. Some of those here noticed may be found afterwards to be common and generally distributed, but this can only be determined by further work ; meanwhile, and as a help towards that end, the publication of such records as we possess seems desirable.

The specimens taken by my friend, the Rev. James Waterston, B.D., B.Sc., as afterwards mentioned, as well as the whole of his large and valuable collection of Scottish Diptera, have been given to me by him ; and when the material which he has brought together from many different localities is worked out, the result will be, without doubt, a very great accession to our knowledge of the Dipterous Fauna of Scotland.

1. MYCETOBIA PALLIPES, *Mg.*—A ♂ taken by Mr. Waterston on Blackford Hill, Edinburgh, 6th August 1906. I have no note of any British records. The species, I think, must be rare, as I have never taken it myself nor seen it in other collections.
2. ORPHNEPHILA TESTACEA, *Ruthé.*—A species of the very greatest interest to students of Diptera, requiring not only a genus but a family to itself. Mr. Waterston captured a ♂ at Whiting Bay, Arran, in September 1906. I have only one other Scottish locality—Bonhill, where it has been taken by Mr. Malloch ("E.M.M.," 1907, p. 87).
3. RHAMPHOMYIA CULICINA, *Fln.* (new to Britain).—I have had this species in my collection for some years as doubtful *culicina*, and am now able to record it, as my specimens agree in every respect with the careful description given by Dr. Lundbeck in the recently published Part III. of his valuable "Diptera Danica." The ♀ is very like the ♀ of *variabilis*, *Fln.*, but is easily separated by the thorax having two stripes (Lundbeck says "slightly visible," but quite distinct in my specimen), and by the presence of a row of acrostichal bristles which are wanting in *variabilis*. The ♂ is quite distinct, being larger than *variabilis* ($4\frac{1}{4}$ - $5\frac{1}{2}$ mm.). The thorax and abdomen are velvet black above, the latter yellow below and at the sides. Wings

brown, halteres light brown. Pilosity of thorax and abdomen weaker. The species is very rare in Denmark, only one ♂ having been taken; and it must be rare here, as I have taken it only in single examples, although in widely separated localities. I found it first at Aberlady—♂, 5th September 1903; then at Aberfoyle—♀, 8th September 1905; Polton—♂, 19th September 1907; and Clunie, near Blairgowrie—♂, 21st September 1910. I have also a ♂ taken by Mr. Waterston at Arniston, 19th August 1905.

4. *EMPIS HYALIPENNIS*, *Flu.*—First recorded as British by Mr. Malloch who took 4 ♀♀ in Murroch Glen, near Bonhill, 25th August 1906 ("E.M.M.," 1906, p. 257). It has not been recorded since; I found a ♀ at Kirkmichael (Perthshire) on 18th August 1910.
5. *CLINOCERA STAGNALIS*, *Hal.*—Apparently unrecorded from Scotland; Mr. Waterston captured a ♂ at Prestwick, 15th September 1904.
6. *SYRPHUS LAPPONICUS*, *Ztt.*—In a lot of Diptera collected by Mr. W. Wylie, Jun., and presented by him to the Perth Museum, which Mr. Rodger sent me recently for examination, I found a ♂ of this rare species, taken at Kinnoul Hill in May 1910. This makes the third recorded British specimen. Previous captures are: a ♀ taken at Pitlochry by Mr. Verrall in June 1870 ("E.M.M." 1886, p. 230), and a ♂ taken at Aviemore by Col. Yerbury in July 1899 ("A.S.N.H.," 1900, p. 22).
7. *ONCOMYIA ATRA*, *F.*—Mr. Waterston found a ♂ at Whiting Bay, Arran, in September 1906. The species of this genus are all rare, and the only Scottish reference I can find for the present one, is Duncan's old record: "neighbourhood of Edinburgh" (1838), as given by Mr. Grimshaw in "A.S.N.H.," 1903, p. 218.
8. *POLIETES HIRTICRURA*, *Meade.*—Mr. Wylie captured a ♂ at Kinfauns in August 1910, which makes the first record for Perthshire. This sex has been recorded from Kilmarnock, Balerno, and The Mound (Sutherlandshire). The only ♀ known was taken by Mr. Waterston in Arran, and described by him in "E.M.M.," 1906, p. 269.
9. *PEGOMYIA TRANSVERSA*, *Flu.*—A ♀ taken by Mr. Waterston in September 1906 in Arran. It is the finest species of the genus and appears to be rare, as among many examples of British *Pegomyia* examined I have seen it from only the New Forest (F. C. Adams). I believe this to be the first Scottish record, as my record of *P. transversa* from Aberfoyle ("E.M.M.," 1905, p. 163) refers to *P. winthemi*, Mg., = *latitarsis*, Ztt.
10. *PEGOMYIA ESURIENS*, *Mg.*—First recorded as British by myself from Comrie ("E.M.M.," 1908, p. 128), and since taken by

Mr. Malloch in Murroch Glen ("E.M.M.," 1909, p. 41). Mr. Waterston took 2 ♂♂ on Blackford Hill, 18th July 1904.

11. *FANNIA (HOMALOMYIA) SIMILIS*, *Stein.*—I have a pair taken in cop. at Musselburgh, 27th June 1907. Meade says "Very rare. I do not know the ♀." So far as I know these are the only Scottish specimens; Mr. Malloch, who has worked out our British species, had not seen this one, although he had taken most of the others. He confirmed my identification.
12. *FANNIA MUTICA*, *Ztt.*—This is another species of which Meade did not know the ♀. I bred several ♂♂ and 2 ♀♀ in June 1906 from Fungi, gathered near Musselburgh, and Mr. Waterston caught a ♂ in Arran, 3rd September 1903. Not previously recorded from Scotland. I am indebted to Mr. Malloch for the identification.
13. *PALLOPTERA PARALLELA*, *Lw.*—I can find no records for this species. It is very like *umbellatarum*, F., but is easily separated by the characters given by Becker ("Berliner ent. Zeit.," Jahrg. 1895). I have taken it only in the Blairgowrie district of Perthshire, but Mr. Waterston has found it at Lochgelly, 27th August 1904; Bute, 12th September 1904; and Arniston, 17th July 1906.
14. *ACIURA ROTUNDIVENTRIS*, *Fln.*—A ♂ taken by Mr. Waterston at Polton, 6th August 1906. Mr. Malloch records it from Bonhill ("E.M.M.," 1909, p. 41). I have no other Scottish record.
15. *APHIOCHÆTA ALTICOLELLA*, *Wood.*—Described by Dr. Wood in "E.M.M.," 1909, p. 114. Mr. Malloch ("A.S.N.H.," 1910, p. 91) gives Bonhill as the only Scottish locality. I have 4 ♂♂ from Aberfoyle taken in August 1906, and named for me as this species by Mr. Malloch.

BLAIRGOWRIE.

ON THE SCOTTISH SPECIES OF *OXYURA* (*PROCTOTRYPIDÆ*)—PART VI.¹

By P. CAMERON.

PLATYGASTERINÆ

INOSTEMMINI.

INOSTEMMA, Hal.

1. *piricola*, Kief., var. *Carmyle*, in garden. This is probably the *I. Boeii* of British authors. On the Continent it is a parasite

¹ Part v. *antea*, No. 76 (1910), p. 217.

of *Contarinia pirivora*, Ril., which lives on the pear. Cf. Kieffer, "Ann. de la Société scientifique de Bruxelles," xxx. 123-125.

PLATYGASTERINI.

This group contains some insects of great economic importance, if of very minute size. *Cecidomyia tritici*, Kirby, the destructive wheat midge, is preyed upon in England by *Platygaster tipulæ*, and Kieffer describes two species of *Platygaster* (*P. longicaudatus* and *P. brevicaudatus*) besides *Trichacis remulus*, Walk., as parasites of *Mayetiola* (olim *Cecidomyia*) *destructor*, Say, in France.

PLATYGASTER, Latr., sec. Foer.

1. *enneatomus*, K., Bishopton ; Bonar Bridge.
2. *parallelus*, K., Banks of Clyde at Newton.

ISOCYBUS, Foer.

1. *ascendens*, K., Possil Marsh ; Cadder Wilderness, near Glasgow.
2. *compressus*, K., Bishopton ; Dumfries ; Colvend.
3. *trochanteratus*, K., Loch Awe ; Glenelg, Inverness-shire ; Cadder ; Colvend.
4. *pyramidalis*, K., Kenmuir, on the Clyde ; Clober Moor, Dumbartonshire ; Dumfries.
5. *horizontalis*, K., Cadder ; Ballantrae ; Bishopton ; Claddich, Loch Awe ; Rannoch ; Glenelg ; Bonar Bridge.
6. *Cameroni*, K., Clyde at Newton.

AMBLYASPIS, Foer.

1. *rufiventris*, K., Island of Mull.
2. *rufistilus*, K., Galloway ; Bonar Bridge.
3. *vitillinipes*, K., Manuel.
- * 4. *tritici*, Hal., Bishopton. This is the parasite of the destructive wheat midge.
5. *tripartitus*, K., Dumfries.

POLYGNOTUS, Foer.

1. *convergens*, K., Cadder.
2. *tuberosus*, Thoms., Kingussie.
3. *rufimanus*, K., Mugdock, from galls of *Hormomyia juniperina*, L.
4. *scoticus*, K., Bonar Bridge, Clydesdale ; Dumfries.

SYNOPEAS, Foer.

1. *xanthopus*, K., Dumfries.

The above list of 19 species appears very poor compared with the 111 species enumerated in Marshall's Catalogue of the British Species. That list includes 67 species of *Platygaster* and 16 of *Synopeas*. My impression is that an examination of Walker's types, the author who has described the majority of these species, would lead to a very large reduction in the number of valid species; and I have no doubt also that if Entomologists would collect them, the number of actual British species would be largely increased. In my list only one species (*Amblyaspis tritici*) has hitherto been recorded as British.

The species of *Platygasterini*, so far as is known with certainty, are parasitic on gall-making or free-living Diptera, chiefly *Cecidomyia*. It is true that some species have been recorded as having been reared from other insects, e.g. *Haltica* and *Apion*, but the presumption is that they have been so recorded in error. It is certain that species of *Synopeas*, *Platygaster*, and *Amblyaspis* have been reared from the nests of *Formica rufa*, *F. pratensis*, *Lasius fuliginosus*, and *Solenopsis* (cf. Kieffer, "Bull. de la Soc. d'Hist. nat. de Metz," xi. 2), but they may have been parasites of the dipterousinquilines living in the Ant's nests, and not on the Ants themselves. Mr. H. J. Donnithorpe, who has made a special study of the inquilines of Ants, tells me that a *Platygaster* has been found in a nest of *Formica rufa*, by him at Rannoch.

As the above concludes my Catalogue of the *Oxyura* which I collected in Scotland it may be useful to give an abstract of the Scotch species known to me. In this list I do not include the *Mymaridæ*, a family of minute, almost microscopic insects, parasitic in the eggs of other insects, for the reason that, with Haliday and Ashmead, I consider them to belong to the *Chalcididæ*, rather than to the *Proctotrypidæ*. I purpose, however, giving a Catalogue of the *Mymaridæ* later.

ABSTRACT.

Species			Species		
<i>Bethylidæ</i>	.	3	<i>Belytinæ</i>	.	52
<i>Dryininæ</i>	.	49	<i>Diapriinæ</i>	.	46
<i>Scelioninæ</i>	.	18	<i>Platygasterinæ</i>	.	19
<i>Proctotrypinæ</i>	.	11			
<i>Ceraphroninæ</i>	.	49			<hr/> 247

Owing to their minute, if not microscopic, size, it is not very easy to make a collection of *Oxyura*. They may be caught in the ordinary way by the use of the sweeping net and beating umbrella, by examining the refuse at the bottom

of haystacks, shifting moss, etc., and by examining windows in country houses.¹ The latter is profitable for *Oxyura*, *Chalcididæ*, and other minute *Hymenoptera*. They may be picked up by a moistened finger or by a camel-hair brush. When my friendly correspondent Mr. John Hewitt, B.A., was Curator of the Sarawak Museum, Borneo, I asked him why he did not send me any micro-Hymenoptera. His reply was that the sweeping net could not be used owing to the nature of the ground, and more particularly, owing to the presence of spiny plants which tore the net. Mr. Hewitt then took to examining the windows, and in that way made a most interesting collection of *Cynipidæ*, *Oxyura*, and *Chalcididæ*, all the species being undescribed, and many of them belonging to new genera.

SCOTTISH TARDIGRADA. A REVIEW OF OUR PRESENT KNOWLEDGE.

By JAMES MURRAY, F.R.S.E.

PLATE I.

IN 1907 (8),² when summarising the knowledge of Scottish Tardigrada, in connection with the work of the Lake Survey, I gave a list of 41 admitted species.

With extended knowledge it is now found necessary to delete several species from the list,—several have changed their names,—and a number of new records are to be added. In consequence of these changes it seems desirable to take another review of the Scottish species.

The observations leading to these changes were made

¹ A hymenopterous insect which is to be found in windows is the Chalcid, *Cerocephala cornigera*, West. (*formiciformis*, West.). As I have said, it is to be found in windows, also in barns and in old dwelling-houses, particularly in those of which the wood-work is well holed by *Anobium*, the "Death-watch beetle," on which it is a parasite. I have found it at Strath Glass, Rannoch, and Clydesdale, in barns; also in Derbyshire in an old house in which *Anobium* was common, crawling on paper. In size it varies from 1 to 3 mm., the latter being the length given by Thomson in his "Hymen Scand." iv. 213. The smaller specimens may be entirely black. I have found it in December.

² Figures in brackets, in heavy type, refer to the Bibliographical List at the end.

long ago, but I was unable to decide on the values of certain forms, which increased acquaintance with Tardigrada in general enables me now to do.

There are 50 species recorded in this paper, being an increase of 9 since 1907. As 2 species have been deleted, there have been really 11 names added. Two of these are new species, 1 has been already recorded as a variety, and 8 are new Scottish records. The identification of 5 of the species is still open to doubt, owing to incomplete information on certain points.

LIST OF ALL ADMITTED SCOTTISH SPECIES.

[An asterisk * indicates additions to the list of 1907 (8).]

<i>Echiniscus suillus</i> , Ehr.	* <i>M. areolatus</i> , Murray.
<i>E. islandicus</i> , Richters.	<i>M. dispar</i> , Murray.
* <i>E. kerguelensis</i> , Richters.	<i>M. ambiguus</i> , Murray.
<i>E. zwendti</i> , Richters.	<i>M. oberhäuseri</i> , Doy.
* <i>E. viridis</i> , Murray.	<i>M. hastatus</i> , Murray.
<i>E. reticulatus</i> , Murray.	* <i>M. arcticus</i> , Murray.
<i>E. gladiator</i> , Murray.	* <i>M. schaudinni</i> , Richters.
<i>E. spitsbergensis</i> , Scourfield.	* <i>M. lacustris</i> , Duj?.
* <i>E. spinuloides</i> , sp.n.	<i>M. zelandicus</i> , Murray.
<i>E. quadrispinosus</i> , Richters.	* <i>M. tetradactylus</i> , Greeff?.
<i>E. oihonnæ</i> , Richters.	<i>M. angusti</i> , Murray.
* <i>E. tympanista</i> , sp.n.	<i>M. macronyx</i> , Duj.
<i>E. granulatus</i> , Doy.	<i>M. dubius</i> , Murray.
* <i>E. blumi</i> , Richters.	<i>M. annulatus</i> , Murray.
<i>E. muscicola</i> , Plate?.	<i>M. tuberculatus</i> , Plate.
<i>Milnesium tardigradum</i> , Doy.	<i>M. sattleri</i> , Richters.
<i>Macrobiotus hufelandii</i> , Sch.	<i>M. papillifer</i> , Murray.
<i>M. orcadensis</i> , Murray.	<i>M. ornatus</i> , Richters.
<i>M. echinogenitus</i> , Richters.	<i>Diphascos chilense</i> , Plate.
<i>M. coronifer</i> , Richters.	<i>D. bullatum</i> , Murray.
<i>M. crenulatus</i> , Richters.	<i>D. oculatum</i> , Murray.
<i>M. harmsworthi</i> , Murray.	<i>D. alpinum</i> , Murray.
* <i>M. montanus</i> , Murray?.	<i>D. scoticum</i> , Murray.
<i>M. intermedius</i> , Plate.	<i>D. spitzbergense</i> , Richters?.
<i>M. pullari</i> , Murray.	<i>D. angustatum</i> , Murray.

REJECTED SPECIES.

The following species, recorded in previous papers, are now rejected, for the reasons given:—

E. arctomys, Ehr. (4), was recorded in error, in consequence of Prof. Richters identifying as *arctomys* an animal which has v. and vi. separate (*E. mutabilis*, = *E. suillus*).

E. mutabilis, Murray (6), is now considered by Prof. Richters as a variety of *E. suillus*, Ehr.

M. islandicus, Richters (14).—This erroneous record is due to carelessness. Had sufficient attention been given to the characters of the claws the mistake would not have been made. The animal thus recorded had claws of the *Diphascon* type, and may have been *M. lacustris* or *M. arcticus*,—the true *islandicus* has claws sufficiently like those of *M. hufelandii*.

ARCTIC SPECIES IN SCOTLAND.

An important feature in the Scottish Tardigrade-fauna is the strong Arctic element. Three-fifths of the Scottish species (30 species) occur also in the Arctic. It is still more important that 7 of the species are only known in Scotland and the Arctic (in one instance also in the intervening Faroes).

An affinity, geographical rather than climatic, is suggested by the fact that 4 of the Arctic species are not found south of the Orkneys and Shetlands. A climatic relation is, on the other hand, suggested by the greater frequency of many of the Arctic species on mountain tops in Scotland.

ARCTIC SPECIES.—*E. suillus*, *islandicus*, *wendti*, *spitsbergensis*, *spinuloides*, *oihonnæ*, *blumi*, *muscicola*; *Milnesium*; *Macrobiotus hufelandii*, *echinogenitus*, *coronifer*, *crenulatus*, *harmsworthi*, *intermedius*, *areolatus*, *dispar*, *ambiguus*, *schaudinni*, *arcticus*, *zetlandicus*, *angusti*, *annulatus*, *macronyx*, *tuberculatus*, *ornatus*; *D. chilense*, *scoticum*, *spitzbergense*, *angustatum*.

CONFINED TO ARCTIC AND SCOTLAND (AND ? FAROES).—*E. islandicus*, *spinuloides*; *M. crenulatus*, *zetlandicus*, *schaudinni*, *D. spitzbergense*, *D. angustatum*.

COMMON TO ARCTIC AND SHETLAND (not yet known elsewhere in Scotland).—*E. islandicus*; *M. coronifer*, *crenulatus*, *harmsworthi*.

SCOTTISH ALPINE SPECIES.

Almost any of the Scottish species may occur on mountain tops, but there are a number which have only been found in such situations, and others which are much commoner there than elsewhere. These peculiarly alpine species are *E. islandicus*, *wendti*, *kerguelensis*, *gladiator* (var. *exarmatus*, only on mountains), *oihonnæ*; *M. coronifer*, *crenulatus*, *harmsworthi*, *zetlandicus*, *areolatus*, *montanus*, *orcadensis*, *D. alpinum*.

It will be observed that the majority of these (9 species) are

also in the Arctic list. Four of the same species (*E. wendti*, *E. oihonnæ*, *M. coronifer*, *M. areolatus*), with many other Arctic species, have recently been found by Heinis in the Alps.

NOTES ON THE SPECIES.

Echiniscus suillus, Ehr. (4).—Hitherto recorded generally as *E. mutabilis*, Murray (6), occasionally as *E. arctomys*, Ehr. (4). The records as *E. arctomys* originated simply in an error in quoting a reference to a figure in Ehrenberg's "Mikrogeologie" (5), whereby Prof. Richters came to regard *arctomys* as a species having v. and vi. separate. This is admittedly not so, and there are no British records of the true *arctomys*.

Richters now recognises *E. suillus* as having v. and vi. separate, and if this is admitted *E. mutabilis* must be united with it, as the differences are very slight. I follow Prof. Richters' authority in this identification, although doubtful of the advisability of trying to establish *suillus*, since its recognition depends solely on the figure, which is a side view, and can therefore tell us nothing as to which plates are paired.

E. kerguelensis, Richters (15).—Loch Morar; summit of Ben Lawers; Kerguelen, and Australia (10). Very near *E. arctomys* and *E. wendti*,—distinguished from *arctomys* by the "fringe," the inner barbs, and the weaker granulation; from *wendti* by the shorter seta *a*, and the smaller barbs.

E. wendti (11).—Summit of Ben Lawers. Recently found (1910) on the summit of Snowdon. It is interesting to find this Arctic species occurring on mountain tops in Britain.

E. viridis, Murray (10).—Discovered in Loch Morar, and afterwards found in Loch Ness. Only dead skins were found, and the species was not described, as I did not know what value to put on the colour, till it turned up alive in Hawaii in 1909. The green colour is confined to the plates, and the proximal part of the 4th legs, as far as the fringe. Internally the animal is of the usual *Echiniscus* red. Seta *a* is very short, and the claws are very large (25 μ).

E. blumi Richters (11).—Broughton, in the County of Peebles, among tree moss, abundant, 1906. Larvæ from Broughton measured 110 μ , and had all the processes as in the adult, and proportionately as long.

A larva from Maxwelltown, Kirkcudbrightshire, was similar in every respect except that it lacked seta *b*, and was considerably larger (150 μ).

Echiniscus spinuloides, sp.n. (Plate I., Figs. 1a to 1c.) Synonym: *E. spitsbergensis*, Scour., var. *spinuloides*, Murray (9).

Specific characters.—Large and broad, red. Plates 9—2 pairs, 2 median, v. and vi. fused; pattern of large hexagonal marks, which do not appear to stand above the general surface, and enclose each an obscure round dot. *Lateral processes* 5—*a*, a short seta, *b*, *c*, and *d* very long setæ, *e*, a spicule, over *b*, *c*, and *d* sublateral spicules. *Dorsal processes*—over *c* a very long seta, over *d* a large curved process with very broad base, tapering to a fine hair. Fringe of few large triangular processes, separated at their bases. Inner claws with barbs far from their bases. Blunt palp at base of 4th leg.

Length up to 300μ , exclusive of the 4th legs, breadth 180μ , seta *a* 50μ , *b* and *c* about 200μ , *d* up to 250μ ; seta over *c* 175μ , over *d* 125μ ; claws 32μ . Eggs up to 5 in the skin, about 90μ by 70μ .

Originally described in 1907 (9) as a variety of *E. spitsbergensis*, Scourfield (18), I am now satisfied that the differences are too great to allow the two forms to be united. They differ in the following points:—the longer lateral setæ of *E. spinuloides*; the longer dorsal seta over *c* and the replacing of the triangular process over *d* by a long seta; the sublateral spicules at *b*, *c*, and *e*; the separated spines of the fringe, and the higher position of the barb on the inner claw. *E. spitsbergensis* has only one sublateral spicule, over *d*; the spines of the fringe are close together at their bases; the barb is nearer the base of the claw.

The sublateral spicules at *b*, *c*, and *d* are readily overlooked, but that at *e* is, from its position, more conspicuous, and I consider this one of the more important characters of *E. spinuloides*.

Very few species have these spicules. *E. oihonnæ* alone has them at *b*, *c*, *d*, and *e*, along with the longer lateral processes. *E. spinulosus*, Doy (1), has only spicules. *E. pulcher*, Murray (10), has them at *b*, *c*, and *d*, and *E. novaezeelandiæ* sometimes has them in the same positions. *E. tympanista*, described in this paper, has the spicules over *b*, *c*, *d*, and *e*.

Habitat.—Scotland, Loch Earn, etc.; Franz Josef Land; Novaya Zemlya.

Echiniscus tympanista, sp.n. (Plate I., Fig. 4.)

Specific characters.—Size moderate, colour red. Plates 9—2 pairs, 2 median, v. and vi. fused, vi. trefoliate. *Lateral processes* 5—*a*, a normal seta, *b*, *c*, *d*, and *e*, subequal thick processes ending in knobs, sublateral spicules over *b*, *c*, *d*, and *e*. *Dorsal processes*—over *c* and *d* short spines. Dots small, uniform, and closely set, of two kinds, the majority pellucid, a few regularly scattered, dark, and looking like perforations. Fringe on 4th legs, and barbs on inner claws.

Length 240μ . *Lateral processes* nearly equal, from 35 to 45μ in length; dorsal spine over *c*, 30μ , over *d*, 20μ .

Related to *E. oihonnæ*, Richters (11), which has the same number of lateral processes, and the same sublateral spicules, it differs in the following points. *E. oihonnæ* has the lateral processes of very long seta and moderate spines or setæ, alternating,—*c* and *e* are very long, and the process over *c* is a hair of moderate length. *E. tympanista* has the lateral processes *b*, *c*, *d*, and *e*, and the dorsal process over *c*, all similar, short thick processes ending in knobs, like drumsticks, hence the name.

Habitat.—Loch Morar.

Macrobiotus orcadensis, Murray (8).—Hitherto only known in one spot, the top of Ward Hill in Hoy, its range has been extended by its recent discovery (1910) on the summit of Snowdon.

M. coronifer, Richters (11).—The record of the egg of this species for Ben Lawers (7) being made in error, the only British record of the animal is that for Shetland (Ronas Hill).

M. montanus, Murray (10).—The identification being made from the egg only, there is a certain doubt about it. Ben Lawers, 1906. The species was described from New Zealand specimens in 1910, but the egg was known long before, both in Scotland and Novaya Zemlya.

M. areolatus, Murray (9) (10).—This was described as an arctic variety of *M. echinogenitus*, Richters (11), in 1907, and was recorded for Scotland as var. *areolatus* in the same year. It was first recognised as of specific rank in 1910, and described in a paper on Canadian Tardigrada (10). India, Africa, Australia, New Zealand, Ascension, Comoro, etc.

M. oberhäuseri, Doy (1).—The record for Scottish lochs, 1905 (6), is doubtful, that of 1907 (8) is wrong. The animal figured in the latter paper is almost certainly a form of *M. arcticus*. The true *oberhäuseri* occurs at Fort Augustus.

M. arcticus, Murray (9).—After experience of this species in the Antarctic, I believe that the animal figured in 1907 (8) as *M. oberhäuseri* is simply *M. arcticus* with its thinner-shelled summer eggs (10). Loch Ness.

M. schaudinni, Richters (16) (Plate I. Figs. 3a, 3c).—Elf Loch, near Edinburgh (W. Evans), Nov. 1905; near Glasgow; Wigtonshire; Loch Morar. This Arctic species was not described for some years after the drawings were made, on which these Scottish records are based. Spitsbergen.

M. lacustris, Duj. ? (3).—Loch Ness, 1906. I consider that *M.*

lacustris should not be accepted as a valid species, because Dujardin, in 1838, figures the animal which he afterwards called *M. lacustris* with two different types of claws (the *dispar* and *diphascon* types), which are not known to occur together on any animal. Prof. Richters, however, accepts it, and ascribes to it only *diphascon* claws (16). Very similar to *M. lacustris* (Richters) are Richters' own two species, *M. murrayi* (15), and *M. breckneri* (17). After reading the descriptions and studying the figures, I find it difficult to grasp any important distinctions between these three species, except in size. Richters makes *lacustris* 500 μ , *murrayi* 600 μ , and *breckneri* 240 μ . But Dujardin in naming his animal *lacustris* (1851) gives the sizes as between 220 and 250 μ , just about the size of *breckneri*. The larger measurement is near enough that of *murrayi*. All have claws of the same (*diphascon*) type, and two rods in the pharynx, which may perhaps differ somewhat in their relative proportions.

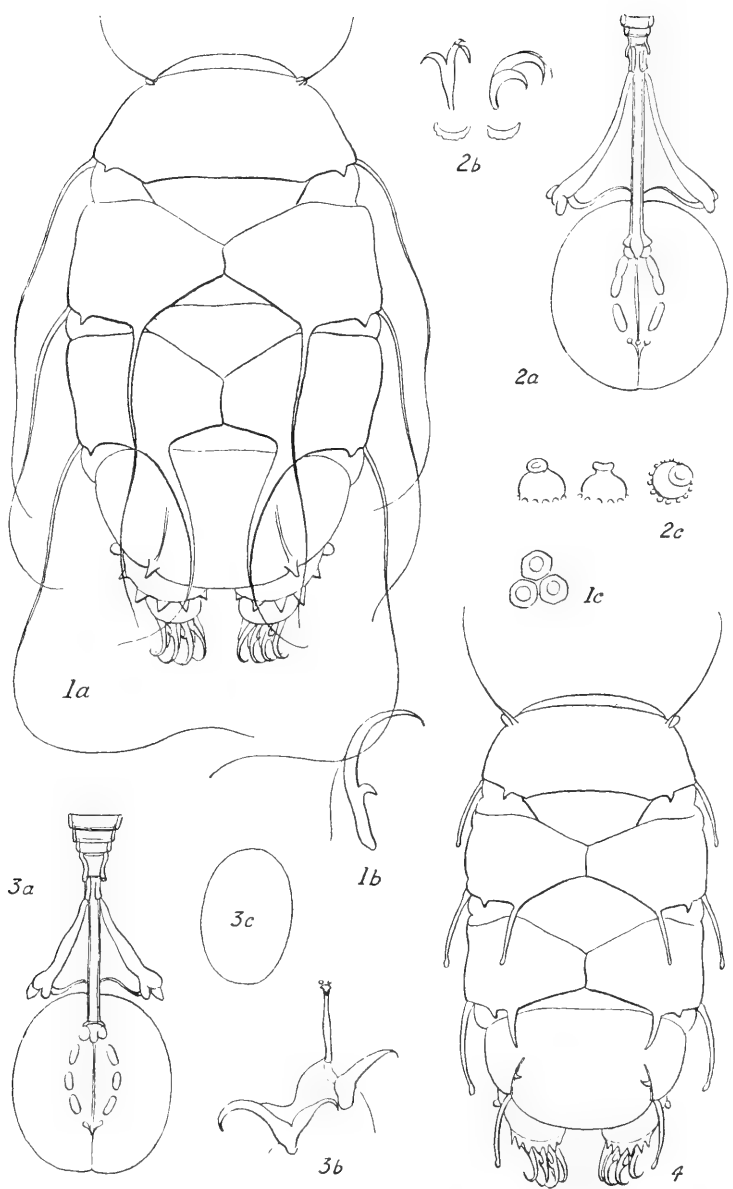
The Scottish examples here recorded as *M. lacustris* measured about 300 μ .

Most of the *Macrobiot*i, which lay smooth eggs, are deficient in good distinctive marks apart from the claws and pharynx.

M. macronyx, Duj. (3).—Most of the Scottish records under this name doubtless refer to *M. dispar*, or some related species, as also I believe most other records. The only authentic Scottish *macronyx* (if we accept the continental identification of it as an animal laying smooth eggs in the skin) is one collected by Mr. Evans near Edinburgh in 1905.

Unfortunately the pharynx has not been seen, but there is no other species asserted to have *dispar* claws and smooth eggs. The Edinburgh skin measured 550 μ , and contained 15 eggs of about 60 μ in long diameter.

Macrobiotus, sp. (Plate I., Figs. 2a-2c).—An egg figured in "Scot. Alp. Tard." (7), has since been found in Shetland with the well-grown young. The claws and pharynx are like those of *M. crenulatus*, Richters (13). Richters, unfortunately, gives no figure of the pharynx of *crenulatus*, but says it is sufficiently like that of *hufelandii*. Scottish examples with the claws of *crenulatus* have the pharynx shorter and rounder than that of *hufelandii*, and the gullet narrower. The young squeezed from the egg here figured has such a gullet and pharynx, and the crescent in front of the claws of the fourth leg is already slightly wrinkled. The processes of the egg are like those of *hufelandii*, but abbreviated, so that the small apical disc is almost sessile on the hemispherical basal portion, which has a



J. Murray del. ad Nat.

circlet of dots as in *hufelandii*. The larger rod in the pharynx is constricted in the middle, its component parts being equal (unequal in *hufelandii*). The end of the gullet in the pharynx has a very prominent rim. Probably this is the hitherto unknown egg of *crenulatus*.

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EXPLANATION OF PLATE.

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| <p>Fig. 1a. <i>Echiniscus spinuloides</i>, sp.n.
 ,, 1b. The same, claw.
 ,, 1c. The same, part of surface pattern.
 ,, 2a. <i>Macrobiotus crenulatus</i>? teeth and pharynx.
 ,, 2b. The same, claws, showing crescent.</p> | <p>Fig. 2c. The same, three processes of the egg.
 ,, 3a. <i>M. schaudinni</i>, teeth and pharynx.
 ,, 3b. The same, claws.
 ,, 3c. The same, egg.
 ,, 4. <i>Echiniscus tympanista</i>, sp.n.</p> |
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SCOTTISH PLANTS, CHIEFLY FROM SKYE,
PEEBLES, SELKIRK, AND KIRKCUDBRIGHT.

G. CLARIDGE DRUCE, M.A., F.L.S.

THE following notes have accrued chiefly from my three visits in 1910 to Scotland, the first undertaken to see the Holy Grass growing in its most southern station, the second to gather *Arabis alpina* in Skye, whence it was gathered in a fruiting condition by Mr. H. C. Hart, the author of the "Flora of Donegal," in 1887. We spent four days in Skye, and were rewarded on the last, a most beautiful day, not only so far as the weather was concerned, but in most romantic surroundings, my godson, Mr. T. H. Leach, being the first to actually gather this great rarity in beautiful flower, and in a situation which is probably a different one from that where Mr. Hart gathered his examples, as it is at a slightly lower altitude than the lowest height mentioned by him. It is rather curious that it should not also have been found on the stony cliffs of Sutherland or W. Ross. We then stayed at Fort William in order to make notes on the elevations to which plants ascend; but the highest mountain is by no means the best for this purpose, as the chaos of rocks near the summit have very little vegetation; and in this inclement year, with its great quantity of snow, few results were obtained. The most interesting plant observed after leaving Skye was *Chærophyllum aureum*, "one of Don's reputed discoveries," growing in immense quantities at Callander, and bearing evidence to the acumen of Poe, who, in one of his romantic stories, tells how a letter of vital importance to the owner, which was being searched for by the most sleuth-hound kind of detectives, was put in a conspicuous position on the mantlepiece, and thus evaded the minute search in the most unlikely places made by those in quest. The name *aureum* given to the plant perhaps has helped in concealing it, since the flowers are pure white, in somewhat larger and more convex umbels than those of *sylvestre*; but the fruits have a yellowish-green colour, while the leaves too have a greenish-yellow tint.

My third visit, in September, was to Forfar and Arbroath.

Among the plants mentioned in the following pages is *Utricularia ochroleuca*, R. Hartm., which was gathered by me in Loch Mallachie in 1887, and recorded by me as *U. intermedia*, in "Journ. Bot." 1888, p. 22. Recently Professor Hugo Glück of Heidelberg, the author of the important work on aquatic species—*Biologische und morphologische Untersuchungen über Wasser- und Sumpfgewächse*, has been staying with me, and he identified this flowerless example confidently with the above species, for he contends that Neuman's suggestion that *ochroleuca* is a hybrid of *U. minor* and *U. intermedia* is groundless, since he has gathered *ochroleuca* abundantly in Bavaria in areas from which *intermedia* is absent. He directed me to a character which enables one to distinguish *ochroleuca* from *intermedia* in the flowerless condition, namely the presence of a few utricles on the so-called barren branches, while in *intermedia* there are none.

I have added a few notes from Skye, which are contained in Professor Lawson's MS. It was his list of plants (published in "Journ. Bot." vii.) which Watson quotes in "Top. Bot." They were made by himself and the Rev. H. G. Fox.

An asterisk denotes a supposed addition to "Top. Bot.," a dagger that the plant is not native.

I have to thank Major Wolley-Dod and the Rev. A. Ley for naming the Roses; Professor E. Hackel, the Pfarrer Kükenthal, Dr. Ostenfeld, Wm. Gregory, and the Rev. E. S. Marshall, for kind assistance.

RANUNCULUS SCOTICUS, *Marshall*.—Sligachan, Skye. Prof. Glück does not think it worthy of specific rank. I have similar but less fleshy plants from marshy meadows in Oxford and Bucks.

R. STEVENI, *Andrz.*—*St. Mary's Isle, Kirkcudbright, 73.

R. BULBOSUS, *L.*—*Near the Hotel, Sligachan, very rare. N.C.R. 104.

CASTALIA ALBA, *Wood*.—Sligachan, 104; Lawson MS.

FUMARIA BASTARDI, *Boreau (confusa, Jord.)*.—*At Galashiels, with Miss Ida Hayward, 79.

CAPNOIDES CLAVICULATA, *Druce*.—Kyle Akin,†Skye, 104; Lawson MS.

- PAPAYER RHÆAS, *L.*—*On rubbish at Innerleithen, Peebles, 78 ; but I failed to see it in corn crops in the county. *Near Galashiels, 79.
- CHEIRANTHUS CHEIRI, *L.*—Well naturalised on the walls of Dundrennan Abbey, 73, Kirkcudbright, 73.
- ARABIS ALPINA, *L.*—At 2150-2300 feet on one of the Cuchullins ; but probably not in the locality where Mr. Hart originally discovered it. It was in beautiful flower in June.
- A. PETRAEA, *Lam.*—Very frequent on Sgur Alastair, etc., Skye, chiefly as the glabrous form.
- BRASSICA ALBA, *Boiss.*—Uig, 104 ; Lawson MS.
- LEPIDIUM SMITHII, *Hook.*, var. *LEIOCARPUM* (*Thell.*).—*Near Thornelee, [on the Peebles side of the river, 78. It is more correctly *L. heterophyllum*, Benth., var. *leiocarpum* (Thell.).
- L. CAMPESTRE, *Br.*—Galashiels, with Miss Ida Hayward, probably adventitious, Selkirk, 79.
- DRABA INCANA, *L.*—Quiraing, Storr, 104 ; Lawson MS.
- RESEDA LUTEOLA, *L.*—Near Innerleithen, Peebles, 78.
- HELIANTHEMUM CHAMÆCISTUS, *Mill.*, *forma* or var. *PARVIFLORUM*.—With flowers about half the size of the normal plant which grew near it at Elibank, Selkirk. I have the same form from Wychwood, Oxon, and am told it maintains its character in cultivation.
- VIOLA RIVINIANA.—Ascends to 3300 feet on Stuich-an-Lochan, 88.
- V. CANINA × RIVINIANA.—*Sgur Alastair, Skye, a puzzling intermediate, somewhat nearer *V. canina*, *teste* Mrs. Gregory. I saw no *eu-canina* there, 104.
- V. SEGETALIS, *Jord.*—*Selkirk, 79 ; Melrose, 1905, 80.
- V. ARVENSIS, *Murr.*, *forma* *SUBLILACINA*, *Watts.*—*Coldisham, 81 ; *Melrose, 80.
- V. LEPIDA, *Jord.*—Dalnaspidal, 96 ; Glen Spean, 97 ; *Dundonnell W. Ross, 1888, 105.
- V. LLOYDII, *Jord.*—Forfar, 90 ; Braemar, 92 ; Thurso, 109.
- POLYGALA OXYPTERA, *Reichb.*—*On a grassy bank, Traquair, Peebles, 78. Near Lawers in some quantity, 88. *Near Sligachan, Skye, 104. I think a distinct species, it has quite a different habit from *vulgaris*.
- P. SERPYLLACEA, *Weihe.*—Sligachan, etc., 104. Ascends to 3300 feet in Mid Perth, var. *vincoides*, Chodat. To this variety perhaps may be referred plants gathered in Glen A'an, Banff, 94, in 1891 ; hitherto only known from Cornwall, but the Scottish specimens have the leaves more widely separated, and the inflorescence not so condensed.

- SILENE MARITIMA, *With.*—Rather frequent on the Cuchullins, 104.
On Corrie Ardran, Mid Perth.
- S. ACAULIS, *L.*—At about 1000 feet by the Allt Dearg Mor, Skye, 104. Descends to 600 feet in Sutherland. Quiraing, Storr; Lawson MS.
- LYCHNIS DIOICA, *L.*—Ascends to 3400 feet on Stuich-an-Lochan, 88.
- CERASTIUM TETRANDRUM, *Curt.*—Cliffs near Port Mary, abundant, Kirkcudbright.
- C. VULGATUM, *L.*, *var. HIRSUTUM (*Fries.*)—Sligachan, 104.
var. ALPINUM, Koch, ascends to 3300 feet on Corrie Ardran, 88.
- C. NIGRESCENS, *Edmonston (arcticum, Lange, p.p.)*. Ascends to over 3500 feet on Ben Nevis. Cuchullins, 104 (recorded in error as *C. alpinum* from the Cuchullins mountains, by Prof. Lawson in "Top. Bot.").
- C. ALPINUM, *L.*—This should be deleted from 104, "Top. Bot.," see above.
- ARENARIA TRINERVIA, *L.*—*Flora Craig, Peebles, 78.
- A. SEDOIDES, *Druce.*—Ben Lawers at 3600 feet. Abundant on the mountain range between Quiraing and Storr, 104; Lawson MS.

(To be continued.)

ALIEN PLANTS.

By JAMES FRASER.

THE following Alien Plants were gathered by Mr. M'Andrew and myself mainly during 1910 (those found in any previous year being only now determined), and this list brings the number seen by us, chiefly in the neighbourhood of Edinburgh, up to about 970.

The locality "Murieston" is the Edinburgh Distress Committee's Labour Colony at Newpark, West Lothian—farms on which much of the city refuse is utilised.

A star in front of a name indicates a new British record.

CRUCIFERÆ.

Brassica monensis, *Huds.* One plant at Leith in 1907, and one at Slateford in 1910. On the East Coast of Scotland this plant is merely casual.

**Cochlearia glastifolia*, *L.* Several fine plants near Musselburgh.

**Erysimum canescens*, *Roth.* Several near Musselburgh, by Mr. M'Andrew.

CARYOPHYLLACEÆ.

Gypsophila viscosa, *Murr.* Several at Portobello and at Murieston.

Spergularia marginata, *Kittel.* One or two at Murieston, which is nearly ten miles from sea.

GERANIACEÆ.

Erodium Botrys, *Bertol.* Several at Galafoot and Melrose in 1908.

Geranium Endressi, *Gay.* A fine colony by the roadside between Innellan and Dunoon.

G. pratense, *L.*, with white flowers. A couple of clumps on railway bank, Trinity.

LEGUMINOSÆ.

**Glycine Soja*, *Sieb. and Zucc.* Several plants up to fifteen inches in height in several places at Leith Docks, but did not flower.

Lathyrus latifolius, *L.* One colony on St. Mary's Isle, Kirkcudbrightshire.

Lupinus luteus, *L.* Several, at Portobello.

Melilotus Petitpierreana, *Willd.* One fine plant at Leith. Under this name I am placing the white-flowered variety of *M. arvensis*, Wallr., following the example of L'abbé Coste, in his "Flore de la France."

**Phaseolus multiflorus*, *Willd.* Some scores of this plant in fine flower, in a disused clay-pit at Portobello.

ROSACEÆ.

**Acæna adscendens*, *Vahl.* Several seedlings at Galafoot in 1908; one, transferred to a garden, flowered this year.

A. Sanguisorbæ, *Vahl.* A firmly established colony on the bank of the Tweed below Leaderfoot. For this plant I am indebted to Mr. J. Roseburgh, Galashiels, who found it in August last. Late in September I found it bearing several fresh flower clusters, and the remains of several others.

CRASSULACEÆ.

**Tillæa pharnaceoides*, *Hochst.* One, at Galafoot, in 1908.

LYTHRACEÆ.

Lythrum Salicaria, *L., var. rosea.* A clump, on shore, east side of St. Mary's Isle, Kirkcudbrightshire.

UMBELLIFERÆ.

Chaerophyllum aureum, *L.* Plentiful on the bank of the Teith below Callander.

Daucus brachiatus, *Sieb.* One or two plants at Galafoot in 1908; first found in Britain, by Miss Hayward, F.L.S., Galashiels.

RUBIACEÆ.

Galium anglicum, *Huds.* Several at Leith and Portobello.

DIPSACEÆ.

Morina longifolia, *Wall.* Several (outcasts) near Musselburgh.

COMPOSITÆ.

Aster Linosyris, *Bernh.* A clump, at Barnton Gate Goods Station, by Mr. M'Andrew.

A. Novi-Belgii, *L.* Several in disused quarries around Edinburgh.

Helipterum hyalospermum, *F. von Muell.* Several at Galafoot. First found in Britain by Miss Hayward, F.L.S., Galashiels.

Hieracium pratense, *Tausch.* Several large patches at Leith Docks along with

H. vulgatum, *Fr.*, *var. subfasciculare*, W.R.L., also in large patches, and along with hundreds of square yards of an unnamed variety of

H. umbellatum, *L.* A fine colony of the last-named species flourishes on Hound's Point, Dalmeny, West Lothian.

Lactuca saligna, *L.* One at Leith.

Matricaria inodora, *L.*, *var. discoidea*, *Celak.* Plentiful at Portobello.

Millotia, sp. not det. Two plants of what appears to belong to this Australian genus, at Galafoot in 1908.

Senecio squalidus, *L.*, *forma.* One at Galafoot in 1908.

CAMPANULACEÆ.

Campanula macrantha, *Fisch.* One in Craigmillar Quarry.

C. Trachelium, *L.* Several near Musselburgh.

**Lobelia Erinus*, *L.* Several at Murieston.

PRIMULACEÆ.

Steironema ciliatum, *Rafn.* Several near Peebles.

HYDROPHYLLACEÆ.

Nemophila insignis, *Benth.* Several on rubbish heaps at Murieston.

BORAGINACEÆ.

Amsinckia intermedia, *Fisch. and Mey.* Several at Slateford.

SCROPHULARIACEÆ.

- Linaria bipartita*, Willd. Several near Slateford.
Veronica longifolia, L. One clump at Leith.

LABIATÆ.

- Salvia Æthiopis*, L. One at Leith.

PLANTAGINACEÆ.

- **Plantago notata*, Lagasca. Several at Leith.
P. virginica, L. One or two at Portobello.

POLYGONACEÆ.

- Polygonum alpinum*, All. A large clump on the shingle between Innellan and Dunoon.

URTICACEÆ.

- Urtica dioica*, L., *var. microphylla*, Haussmann. One, near Slateford, by Mr. M'Andrew.

GRAMINEÆ.

- **Agrostis nebulosa*, Boiss. and Reut. Several near Slateford.
 **Avena bromoides*, L. Several near Musselburgh. I am indebted to Professor Hackel for the name.
 "Bromus hordeaceus typicus, Beck." *forma*. One clump at Leith. The number of flowers in the spikelets is smaller and the panicle is very contracted, but Professor Hackel says that these may be only casual differences from the type.
 **Dactylis glomerata*, L., *sub-sp. hispanica* (*D. hispanica*, Roth.) *forma angustifolia*. Two or three plants at Leith in 1903, and many near Musselburgh in 1910. Professor Hackel, to whom I am indebted for the name, says that its leaves being somewhat narrower than usual may justify its being named "*forma angustifolia*."
Festuca heterophylla, Lam. Plentiful among planted shrubs by the Tweed below Peebles.
Hordeum nodosum, L. One plant at Leith in 1906, and one at Galafoot in 1908. It is abundant and thoroughly established on the margin of a field at the Quay, Dalbeattie, Kirkcudbrightshire, where it was first observed by Mr. M'Andrew in 1883.
 **Koeleria setacea*, DC. Several near Musselburgh.
Panicum Crus-Galli, L., *var. submuticum*. Two or three at Leith.

SCOTTISH HIERACIA.

G. CLARIDGE DRUCE, M.A., F.L.S.

A CONSIDERABLE quantity of Hawkweeds which had been gathered by me has recently been kindly examined by the Rev. A. Ley. Doubtless some of these have been already recorded for the various counties, but several are "new records." Skye proved rather rich; doubtless the warm dry June of 1910 stimulated them to flower.

HIERACIUM PILOSELLA, *L.*, var. PSEUDOPILOSELLA (*Ten.*), *forma* ATRICHIDIUM (*Williams*).—Sligachan, Skye, 104.

H. ANGLICUM, *Fries*, var. LONGIBRACTEATUM, *F. J. H.*—Sligachan, 104. A form with nearly glabrous leaves at Inchnadamph, 108.

*H. LANGWELLENSIS, *F. J. H.*—Glen Brittle, Skye, 104.

H. ALPINUM, *L.*—At 3200 feet on Corrie Ardran, M. Perth, 88.

H. CURVATUM, *Elfostr.*—Glen Avon, Banff, 94, 1882.

H. NIGRESCENS, *Willd.*, var. GRACILIFOLIUM, *F. J. H.*—Tyndrum, 88.

H. SUBMURORUM, *Lindeb.*—Glen Clova, Forfar, 90.

H. LEYI, *F. J. H.*—Clova, 90; with H. SENESCENS, *Backh.*, West Ross, 105.

H. ARGENTEUM, *Fr.*—Corrie Ardran, 88; Sligachan, Skye, 104.

H. CLOVENSE, *Linton.*—Corrie Ardran, 88.

H. SANGUINEUM, *W. R. Linton.*—Corrie Creach, Sgur Alastair, Glen Brittle, Sligachan, Skye, 104; Dalnaspidal, 88; Strath Voich, 106!.

H. MURORUM, *L.* var. ASYMMETRICUM (*Ley.*)—Sligachan, 104; Inchnadamph, 108.

var. MICRACLADIUM, *Dahlst.*—Sligachan, 104; var. SUBTENUIS, (*W. R. L.*), Corrie Ardran, 88; Glen Brittle, 104; Inchnadamph, 108.

*var. PROLIXUM (*Dahlst.*)—Sligachan, 104.

H. CANDELABRAE, *W. R. L.*—A variety of this with less purple leaves, which are more obtuse, with the basal portion of the leaf narrowed, and without the retrorse teeth of the type, occurred at Inchnadamph, 108; it may be provisionally called var. DAVII, after a lady who has done very good work at that interesting locality.

H. CILIATUM, *Almq.*—Near Applecross, 105; Ben Hope, 108.

- H. SERRATIFRONS, *Almq.*, var. MORULUM, *Dahlst.*—Glen Thulachan, 89, 1899; Ben Hope, 108.
- H. SUBULATIDENS, *F. J. H.*—Lochnagar, 92.
- H. RIVALE, *F. J. H.*—Ben More, Betty Hill, 108.
- H. CREBRIDENS, *Dahlst.*—E. Ross, 106.
- H. SAGITTATUM, *Lindeb.*, var. SUBHIRTUM, *F. J. H.*—Clova, 90.
- H. SARCOPHYLLUM, var. EXPALLIDIFORME.—Ben Heasgarnich, 88.
- H. CAESIUM, *Fr.*, var. ALPESTRE, *Lindeb.*—Dalnaspidal, 88; Sligachan, 104.
var. RHOMBOIDES (*Stenstr.*).—St. Mary's Loch, Selkirk, 79; Dalnaspidal, 88; Inchnadamph, 108.
- H. DECOLOR, *Ley.*—Dalnaspidal, 88.
- H. DUPLICATUM, *Almq.*—To this Mr. Ley refers my Corrie Ardran plant, which I thought was ANFRACTIFORME; and he also queries another specimen as the var. STENOPHYTES, *W. R. L.*
- *H. EUSTALES, *Linton.*—Sligachan, 104.
- H. VULGATUM, *Fr.*—Type, Betty Hill, 108; Lunan, 90.
var. SEJUNCTUM, *W. R. L.*—Selkirk, 79; Lawers, 88; Tyndrum, 88; and in Argyll, 97; Betty Hill, 108.
var. SUBFASCICULARE, *W. R. L.*—Lawers, 88.
- H. ACROLEUCUM, *Stenstr.*—Rodona, 79; Melrose, 80; Corrie Ardran, 88.
var. DÆDALOLEPIUM (*Dahlst.*).—Sligachan, 104; Betty Hill, 108.
- H. SEPTENTRIONALE, *Arv. Touv.*—Glen Spean, 97, 1891.
- H. STRICTUM, *Fries.*—Elgin, 95, *teste*, Hanbury.
- H. UMBELLATUM, *L.*, var. FILIFOLIUM, *Fries, teste.*—Backhouse, Strathspey, 96.

VICIA OROBUS, DC.

By ARTHUR BENNETT, F.L.S.

Vicia Orobus, DC., "Fl. France," v. (1815), 577.

Orobus sylvaticus, L., Cent. 1., pl. 1755.

A remarkable form or variety of this species occurs at Dalmeny, West Lothian (Robert Turner, sp., Aug. 1881), this recedes from the typical plant towards *V. cassubica*, L., in the peduncles and flowers being shorter than the leaves, the stipules entire (or here and there very slightly toothed),

the habit slender and much more rigid, and in being subglabrous, and altogether having quite a different aspect from the ordinary plant. It may be called *f. gracilis*. Other specimens from the Island of Canna, V.C. 104, from S. M. Macvicar, have stipules two-thirds the usual length and with many deeply cut teeth.

"The why and wherefore" of the distribution of this species both in Britain and in Europe has always been a puzzle to me; and I should be glad if anyone can point out why it is so peculiar.

In Europe it is known only in S. Norway (Sansand, 61° 20' N. lat.), Denmark, Jutland, Schleswig-Holstein, N. Bavaria, very rare; Spain, Picos de Europa, France, Pyrenees, Auvergne, Herault, Mont Pilate. Reported from Transylvania, but the plant was *O. vernus*.¹

In Great Britain all its localities lie west of Long. 1° 40' W. In south-central Scotland it occurs in 14 counties, in Wales 9 counties, in England 11 counties, and in Ireland 4 counties.

Its eastern limit in England is Hampshire, in Scotland Longformacus in Berwickshire (Rev. A. Baird) at about 2° W. long.

In most floras the species is called "sparingly hairy"; but in the young flowering state (May 28) the stems are densely silky hairy with pale brown hairs, the leaf-stalks, underside of leaves, less so the upperside, and the young flower-heads are enveloped in a dense hairy growth. By July (in Radnor), when the pods are fully formed but far from ripe, the stems become semi-glabrous, the leaves mostly so. Seedlings have the first and second leaves glabrous.

Mr. Watson² says "Low grounds," but it occurs at 686 feet in Edinburgh, 700 feet in Perth, 800 ft. in Dumfries, and 1310 feet in Hereford, Rev. Mr. Ley *in litt*.

Dr. Prior³ gives as its names, "Bitter Vetch, Kippen-nut, and Cormeille," but the latter applies to *Lathyrus montanus*, Berch., as he himself says at p. 52. Under Kippen or

¹ Neilrech, Nach. z. Maly's "Enum. pl. imp. Austria." (1861), 315.

² "Consp. Cyb. Brit." 1868 (1870), 149.

³ "Pop. Names. Brit. Plants" (1870), 289.



Kippen-nut, he remarks: "Called in Scotland 'Knapperts,' from knap or knob, and urt, wort, the heath-pea, *Vicia Orobus*." But has *Orobus* these enlarged tubers or knobs? Bentham says, "root somewhat creeping," the allied European *V. cassubica*, L., has long creeping stolons. Not any of my numerous specimens of *Orobus* has roots attached.

It is also called "wood bitter vetch," but certainly is not confined to woods; in Cornwall it grows in "Moors in rough furzy ground"¹ and in Ireland on "basaltic rocks"² (Stewart, sp.) in Antrim. In Bishop Nicolson's M.S., 1690,³ he calls it "nostrotibus, Horse-pease," the plant is still existent at Blencairn where he recorded it.

The first record for the species in Great Britain is

"*Orobus sylvaticus nostras*. At Bigglesly (Gainbledy) in the way to Pereth (Penrith) in Cumberland." Ray, "Cat. Pl. Angl." (1670), 339, Clarke, "First Rec. Brit. Pl." (1900), p. 42.

PYROLA SECUNDA, LINN.

("SP. PL.," 1753, 396.)

By ARTHUR BENNETT, F.L.S.

Rameschia secundiflora, Opiz., "Seznam," 1852.

R. secunda, Garcke, "Fl. N. and M. Deutsch." (1858), 222.

Actinocyclus secundus, Klotzsch. "Monatsb. Akad. Berlin" (1857), 14.

Alsogonum (section of *Pyrola*), Gray, "Nat. Arr. Brit. Pl." (1821), 403.

P. secunda tenerior, "Ger. em." (1633), 408.

P. tenerior, Parkinson, "Theat. Bot." (1640), 509.

P. folio mucronato serrato, Ray, "Syn." (1690), 176.

The first certain record for Great Britain was—"In shady birch woods among the moss . . . near Little Loch Broom in Ross-shire," Lightfoot, "Fl. Scot.," i. 219, 1777.

¹ Davey, "Fl. Cornwall" (1909), 132.

² Stewart and Corry, "Fl. N.E. of Ireland" (1888), 39.

³ Hodgson, "Fl. Cumberland" (1898), 89.

Ray, *l.c.*, is supposed to have recorded it from Yorkshire, at Haslewood; but Dr. Lees¹ considers that his record applied to *P. minor*, L., which (at present anyhow) alone occurs there.

The records of distribution of this species have been considerably extended of late years, and in a direction not looked for. Mr. Bentham in his "Flora" of 1858 remarks: "Generally more northern or more alpine, being rarely found in central or southern Europe out of the higher mountain-ranges." And Watson² places it in his "Highland type"; but later³ he refers it to his "Scottish type." Up to the year 1878 its most southern station in England was Cautley Crags on Howgill Fells, near Sedburgh, in N.-W. Yorkshire; but in June, 1876, it was found by the Rev. A. Ley (*sp.*), on limestone, in woods on the Wyndcliff, Monmouth, growing with *P. minor*, *Convallaria majalis*, *Polygonatum officinale*, *Sedum rupestre*, *Pyrus Aria*, and *P. rotundifolia*, *Cornus sanguinea*, etc.

In 1892 Dr. Trow (*sp.*) gathered it on Craig-y-Llyn, above Llyn Faur, Glamorgan; and it was found in another place above Llyn Fach, in 1905, by Messrs. Salter and Trow.

In April and July, 1906, it was found by Mr. H. H. Knight (*sp.*) on Fan Nedd, about 1750 ft. alt. in Brecon. In Glamorgan it occurred at about 1600 ft. alt.

These three stations bring the species some 200 miles south of the Yorkshire one, the Glamorgan and Monmouth stations being nearly on the same parallel.

There is a station at High-Cup-Nick,⁴ near Appleby, in Westmoreland, not recorded for that county either in "Top. Bot." or its Supplement.

In Yorkshire it occurs at 2000-2200 ft. alt. (Lees, *l.c.*); in Scotland, from "sea level in Moray," Dr. G. Gordon, up to 2000 ft. in Atholl, Perth.⁵ Its most northern station in Scotland is "Beinn-a-Bhragie, 1256 ft. alt., in V.C. 107, E. Sutherland (J. Grant, *sp.*), about 57° 43' N. lat. In

¹ "Fl. M.W. Yorkshire" (1888), 322.

² "Cyb. Brit." ii. (1849), 161.

³ "Comp. Cyb. Brit." (1870), 244.

⁴ Baker, "Fl. N. Yorkshire," ed. 2 (1892), 337.

⁵ "Fl. Perth." (1898), 216.

Arctic Norway¹ up to 70° 50'. Norman describes a var. *dispersiflora*, seemingly only differing in the raceme being "dispersed, not secund." It there flowers from July 29 to September 8.²

Moneses uniflora, A. Gray, has its northern limit in Scotland about one mile north of *P. secunda*, where it grows and flowers freely, in company with *Linnæa borealis* (Dr. Joass, *sp.*).

In Ireland, *P. secunda* is rare; there is a specimen in the Belfast Museum, labelled "Derry, Mr. Brown." Robert Brown lived in Derry about 1801. It was found by Dr. Moore in Derry about 1836, but remained unrecorded till found by Mr. Fetley on June 26, 1901.³ Mr. L. Praeger found it in Co. Fermanagh in 1904, on "Upper carboniferous limestone, capped by Yoredale sandstone, at an alt. of 1135 ft.; here it occurred in abundance with *P. minor*, *P. media*, *Sesleria*, *Asplenium viride*, etc., growing not only among the stunted heather and in the *Sesleria* patches on the cliff, but even covering bare slopes of orange sand formed by the disintegration of the rock, and on a mossy boss under a low sandstone scarp."⁴ In the "Flora of Dumfries" (1896), 114, Mr. Scott-Elliot describes its localities: "On dry whinstone rocks, with very little soil, in sun, but partly wind-sheltered, in narrow corries, under the influence of the humid atmosphere from the burns."

In the fourth volume of the "Cyb. Brit.," 175-233, under "Zones of altitude," *secunda* is given from 3, 4, 5; 3 no doubt applying to the Moray⁵ coast station.

To show the boreal-alpine tendency contrast the following, found in Wales:—

Dryas octopetala—Carnarvon to Orkney.

Potentilla alpestris—Montgomery to W. Sutherland.

Carex pauciflora—Carnarvon to Orkney.

Lycopodium annotinum—Carnarvon to Orkney.

Epilobium alsinifolium—Carnarvon to Shetland.

¹ "Index Supp. Soc. S. Arct. Norway" (1864), 26.

² Norman, "Norges Arct. Fl." (1895), 441.

³ "Irish Naturalist" (1901), 171.

⁴ "Irish Naturalist," xiii. (1904), 236.

⁵ "Coll. Fl. Moray" (1839), 15.

and these, not found in Wales :—

Cornus suecica—Yorkshire to Shetland.

Arbutus Uva-ursi—Derby to Shetland !.

Kobresia caricina—N.W. York. to Argyll and Perth.

Carex capillaris—M.W. York. to Shetland.

Tofieldia palustris—N.W. York. to Caithness.

Salix Lapponum—Westmoreland to Orkney ?.

All these are given the same zones as *P. secunda*. Of course, there may be later examples, but these suffice.

Cornus suecica was found last year on “moorland, near Darwin, in South Lancashire.”¹ Mr. Travis *in litt.*

To show the tendency of *P. secunda* in Europe, take France, for instance. It occurs in “La region des sapins dans les Vosges, le Jura, l’Auvergne, les Alps, et les Pyrénées.”²

The distribution in England now is :—

Co. 35 !, 41 !, 42 !, 65, 68, 70 !.

In Scotland—72 !, 73, 80, 83 ?, 85, 88 !, 89, 90 !, 91 !, 92 !, 93, 94 to 99 !, 102 !, 104, 105, 106, 107 !.

Ireland—Antrim, Londonderry, Fermanagh.

It has also been reported for Sussex, in error for *P. media*.

64. York, error for 65.

67. Northumberland. Not really an error, as Yevering Bell Hill is really in Northumberland, though quoted as Cheviotland.

75. Ayr.

76. Renfrew.

77. Lanark, near Busby. Dr. Ross, not confirmed.

In the “N.B. Guide” (1837), 530, Yevering Bell, is placed to 81, Berwick. Of the others—

80. Roxburgh, J. Knapp, 1837.

83 ? Slateford, August, R. P(arnell). This may be in Ayr, or it may be Edzell (Aigle or Eagle) in Forfar ?

85. Kinross (Fife), Herbert Walker-Arnott, 1837. I owe these three records to Mr. M’Taggart Cowan, from the Edinburgh Herbarium.

¹ “Lancashire Naturalist,” August 1910, 161-164.

² Gren. et Godr., “Fl. Fr.,” ii. (1850), 1439.

Elsewhere *P. secunda* is recorded from the major part of Europe.

Asia—Corea, Davuria, Siberia.

N. America—Canada to the River Mackenzie, Greenland.

United States—Nebraska, along the Rocky Mountains, to Mexico and California.

ZOOLOGICAL NOTES.

An Old-time Vermin List.—I am indebted to Mr. W. J. Herries Maxwell of Munches for his permission to publish the following "List of Vermin destroyed and Premiums paid for the same, on the Duchess Countess of Sutherland's Estates in the County of Sutherland, from March 1831 to March 1834."

This list was sent to Sir William Jardine, the celebrated naturalist, by Mr. John Baigrie in a letter dated "Scowrie, 15th September 1834," and with other correspondence is now in the possession of Mr. Maxwell, Sir William's grandson.

I have not been able to ascertain exactly who Mr. Baigrie was, but from the opening sentence of the letter referred to we may take it that he was employed on the Sutherland estates. This letter begins:—"I regret very much that I have been prevented from sending you sooner the list of the vermin, which has been occasioned by my having been much engaged since the Duchess came to the country."¹

The list, which, as far as I know, has not been previously published, itself calls for very little remark, being but a plain statement of painful facts.

The "548 King's Fishers" enumerated as having been destroyed at 6d., or at a total cost of £13:14s., were probably Dippers (*Cinclus cinclus britannicus*).

LIST OF VERMIN DESTROYED AND PREMIUMS PAID FOR THE SAME, on the Duchess Countess of Sutherland's Estates in the County of Sutherland, from March 1831 to March 1834.

	s.	d.	£	s.	d.
71 Old Bitch Foxes	at	42 0	149	2	0
49 Young „	„	20 0	49	0	0
73 Old Dog Foxes	„	15 0	54	15	0
46 Young „	„	7 6	17	5	0
901 Wild Cats, Martins, and Polecats	„	2 6	112	12	6
418 Weasels	„	1 0	20	18	0

¹ [Mr. John Baigrie was local Factor on the Estates of the Duke of Sutherland in Assynt and Edderachyllis prior to that post being occupied by the late Mr. Evander M'Iver.—J.A.H.-B.]

	<i>s.</i>	<i>d.</i>	£	<i>s.</i>	<i>d.</i>
263 Otters	at	5 0	65	15	0
171 Full Grown Eagles	„	21 0	179	11	0
53 Young Eagles and Eagles' Eggs	„	10 0	26	10	0
936 Ravens	„	2 0	93	12	0
1055 Hawks	„	1 0	52	15	0
1739 Carrion-Crows and Magpies	„	0 6	43	9	6
548 King's Fishers	„	0 6	13	14	0

—HUGH S. GLADSTONE, Thornhill, Dumfriesshire. £878 10 0

Whaling in Shetland 1910.—Whaling in Shetland was very late in beginning this year. At the Alexandra Company's station, with the exception of a Bottle-nose Whale, no whale was got before the 14th of May. For the rest of the year the whales were remarkable for the fatness of the blubber; excluding the Bottle-nose 99 whales were killed against 101 in 1909, but over 700 more barrels of oil were got. The result worked out:—

<i>B. musculus</i> , Finners,	Bulls, 33,	Average length	57.4 feet.
„ „	Cows, 37,	„ „	60.0 „
<i>B. borealis</i> (Seihval)	Bulls, 13,	„ „	44.0 „
„ „	Cows, 10,	„ „	47.3 „
<i>Megaptera</i> , Humpbacks,	Bulls, 2,	„ „	32.2 „
„ „	Cows, 2,	„ „	45.5 „
<i>B. biscayensis</i> , Nordcapers,	Bull, 1,	„ „	51 „
„ „	Cow, 1,	„ „	51 „

This is the first year that the Alexandra station has got a Nordcaper, but I was told the Olua station had got two also. These whales are valuable on account of the length and value of the baleen. It is also worthy of notice that four Humpbacks were got; these whales give a large quantity of oil for their size. The two stations at Ronas Voe were not very successful, but the Olua station did well. I did not see much of the station as I was unwell most of the summer, and cannot tell if there was much of interest to be recorded.—R. C. HALDANE, Ollaberry, Shetland.

White-beaked Dolphins in the Upper Estuary of the Forth.—At Blackness on the Linlithgowshire side of the Estuary of the Forth, I examined on 7th February last (1911) two adult White-beaked Dolphins (*Lagenorhynchus albirostris*) which had been stranded on the mudflats immediately to the east of the castle on the 3rd and 4th of the month respectively. After being on view on the beach in front of the village for a couple of days, they had been removed by the sanitary inspector's orders to a point about half a mile farther west to be buried, and I arrived just in time to see the last of them. As it was I had only a few moments in the case of one of them to make a general note of its appearance and

take its length, 8 feet 3 inches, by a hasty application of the foot rule. Of the other, that stranded on the 3rd, I was able to make a more thorough examination, and I took the following measurements:—Length in a straight line from tip of beak to fork of tail 8 feet 8 inches, depth in front of dorsal fin rather more than 2 feet, height of dorsal fin 1 foot 1 inch, length along the anterior margin of same 2 feet, length of anterior margin of flipper 1 foot 7 inches, length of beak beyond facial groove $2\frac{1}{4}$ inches, from tip of beak to eye $10\frac{1}{2}$ inches, mandible projecting perceptibly beyond beak, width across tail approximately 2 feet 4 inches, the points having been cut off. General scheme of coloration dark slaty black above, white beneath and over the beak. The distribution of these colours and their modifications was almost exactly as described by Sir William Turner in his account of the adult female taken off Stonehaven in July 1888 ("Proc. Roy. Phys. Soc.," x. 14). I especially noticed the greyish white ridge behind the dorsal fin. Unfortunately many of the teeth had been removed, so that I cannot state their original number, but I estimated it at about 48 in each jaw. This was a female, and so also, I believe, was the other, which was very similar to it in every respect.

Several of these cetaceans were stated to have been frequenting the estuary about the time these two were stranded. This is but the second occasion on which the white-beaked dolphin has been recorded from the Firth of Forth. The first record is that by Mr. Bruce Campbell ("Ann. Scot. Nat. Hist.," 1907, p. 65) of a male captured off Cramond in March 1907.—WILLIAM EVANS, Edinburgh.

Albino Weasel near Loch Awe.—Colonel E. S. Evans, C.B., writes me that he shot an Albino Weasel (*Mustela vulgaris*) on "3rd December 1901, close to the junction of the Oban and Ford cross roads." This specimen, which was a genuine Albino having "brilliant pink eyes," was unfortunately lost owing to the stuffer to whom it was sent being away from home.—RICHARD ELMHIRST, Marine Station, Millport.

A Friendly Stoat.—A Stoat (*Mustela erminea*) in its winter dress, save only a brown patch on the nape, has been a constant and welcome visitor here since the end of last November. Extremely tame and confiding it came daily for a time in mid-winter to the food put out for the birds within a few feet of the windows, never attempting to molest the birds, which paid but little attention to it beyond fluttering a few yards away. On one occasion it was seen climbing nimbly in a hazel-bush, some 10 or 12 feet from the ground; and still frequents the immediate vicinity of the house. Formerly there were always rats about, but since the advent of the Stoat not one has been seen; some moles, too, that were troublesome have also disappeared. With a plague of rats throughout the

country there seems to be a lesson here as to the folly of undue interference with the balance of Nature. — CHAS. H. ALSTON, Letterawe, Loch Awe.

White Common Hare in Dumfriesshire.—Mr. Cecil Laurie informs me that on 27th December 1910 he shot a white brown-hare in Beuchan Wood. He is certain that it was *L. europæus* and not *L. timidus* (the Mountain Hare), on account of its size and also its legs and pads, which were brown. He is, moreover, well acquainted with both species of hares; but it is unfortunate that the skin was not kept. I have in my collection a white hare which was found dead near Byreholm, on 20th December 1903. This specimen is completely white, with only a suspicion of a brown hair here and there. On 20th November 1907 a hare with a white face and white forefeet was shot at Carron Water. All the above-mentioned places are within a radius of five miles of Thornhill, Dumfriesshire.—HUGH S. GLADSTONE, Thornhill, Dumfriesshire.

Winter Visitors to Wigtownshire.—On 25th November 1910, nineteen Whoopers alighted on the White Loch of Myrton, a sheet of water some 60 or 70 acres in extent within the park at Monreith. I watched them through the glass for a long time at a distance of not more than 250 yards. They were all in adult plumage except three cygnets. They were joined in the night by two other adults and two cygnets, and took their departure about 9 A.M. The loch has been treated as a sanctuary for wild fowl for more than seventy years. The Mute Swans on the loch did not pay the slightest attention to the strangers. On 7th January 1911, when Viscount Dalrymple, M.P., Captain Aymer Maxwell, and the Hon. Gerald Legge were shooting wild fowl on Cults Loch near Castle Kennedy, they flushed a Bittern several times. It is agreeable to record that, although the bird might easily have been shot, none of the three sportsmen dreamt of firing at it. *O si sic plures!* The bird was flushed three times to put its identity beyond doubt.—HERBERT MAXWELL, Monreith.

The Northern Bullfinch, Holböll's Redpoll, etc., in the Lothians.—With reference to the records from Fair Isle and the Isle of May in the January "Annals," I have a Northern Bullfinch which was caught on 29th October 1910 at the nursery gardens, Archerfield, East Lothian, by Mr. Logan, forester, from whom I subsequently obtained it. Having heard that an unusually fine bullfinch had been got at Archerfield I went to see the bird, and was pleased to find it to be a typical *Pyrrhula pyrrhula* (Linn.); a large brightly-coloured male with a wing measurement of fully 94 mm., and a bill of about 11 mm. along the ridge. On 31st October, a bullfinch, probably also of this race, rested for some time at Barnsness lighthouse, near Dunbar, as I was informed by Mr. Budge, the light-

keeper; and Mr. Dewar, bird-dealer, Edinburgh, tells me he saw at the bird-show in Berwick-on-Tweed in the end of November a "Russian" bullfinch which had been recently caught in that neighbourhood. This is not the first occasion, however, on which this large race has occurred on the coast of East Lothian. One which I have a note of and used often to see, was captured at Ferneyness on the coast near Longniddry, about the end of October 1884 by a mason named James Chirnside, who was very proud of it and kept it alive for several years. Chirnside's "big bully" was well-known in the neighbourhood.

Among the many Mealy Redpolls that visited the Lothians in the latter part of October and beginning of November there were numbers of those large birds to which the trinomial *A. l. holboelli* has been given. One which I obtained at Skateraw, near Dunbar, on 29th October is, Dr. Hartert considers, correctly referred to this form, and I have seen others from Tranent, Prestonpans, Leith, etc. It is doubtful, however, if *holboelli* merits even subspecific rank; but, in whatever light it may be regarded, it is clear the Mealy Redpoll from near Edinburgh, figured by Selby in 1825, was this large form.

Besides the Waxwings already reported in the "Annals" one was killed near Gilmerton, Midlothian, in December, and another, which I saw in the flesh on the 8th of that month, was shot near Kirriemuir, Forfarshire. On 11th November a Great Grey Shrike, was shot at Tyne Estuary, near Dunbar.

Little Auks were fairly plentiful in the Firth of Forth throughout the winter. The first I have a note of was a disabled one which I very nearly captured on the beach at Skateraw on 17th October. Altogether I handled about a dozen examples that were shot or cast on the beach, mostly near North Berwick, during December and January, though one was from as far up the Firth as Cramond. On 14th January I found a dead Fulmar at North Berwick, the third got there since autumn. Not far off Elie on 8th September, I saw from the steamer what I am sure was a Sooty Shearwater, and about a week later the Kellys, North Berwick, who know the bird well, told me they saw one, quite close to their boat, near Fidra on 9th September.—WILLIAM EVANS, Edinburgh.

Mealy Redpoll and Siskin in Mull.—On 21st October last I identified for the first time in Mull the Mealy Redpoll (*Acanthis linaria*) feeding along with Twites on the seeds of *Centaurea nigra*. On 2nd and 3rd November, fully twenty Siskins (*Chrysomitris spinus*) were seen feeding also on the seeds of above. Only once before have I noticed the latter species here.—D. MACDONALD, Tobermory.

Supposed Gird Bunting in Sutherland: a Mistake in Identification.—Having recently had occasion to look into the Scottish

records of the Cirl Bunting (*Emberiza cirlus*), I have, through the kindness of the Rev. Dr. Joass of Golspie, seen the supposed example reported in the "Annals" for 1909, p. 205, and find it to be an ordinary male Yellow-hammer (*E. citrinella*). There is no doubt about it, as Mr. Eagle Clarke and others to whom I have shown it can testify. Dr. Joass tells me that the bird was killed by a cat at the Manse, Golspie, on 9th January 1905, and sent to Thurso to be stuffed. He also informs me it is the "Cirl Bunting" referred to by Miss Lennie in the "Scottish Geographical Magazine" for March 1911, p. 140, as having been got at Golspie last summer.—WILLIAM EVANS, Edinburgh.

Notes on a Nest of the Snow Bunting.—As a most interesting case illustrating the nesting habits of the Snow Bunting (*Plectrophenax nivalis*) has recently been placed in the Royal Scottish Museum Edinburgh, it may be as well to put on record the history of the particular nest in question. Some years ago my brother, Mr. W. T. Blackwood, located several pairs of Snow Buntings on various "screes" in the Cairngorms, but, prior to last year, both he and I failed to find a nest, though we made repeated attempts to do so. However on 18th June 1910, when searching a scree in Aberdeenshire he noticed a hen Bunting carrying nesting material, and he then had little difficulty in locating the nest, or rather, its foundations, for the bird had only commenced building. Two days later the nest, completed and lined with ptarmigan feathers, contained one egg and four more were eventually laid. I was taken to the place on 24th June and received a few photographs of the hen and of the nest. Some of these were used as an aid in the setting up of the case, and I cannot praise too highly the manner in which this has been done. Everything looks so natural that it would serve no purpose if I gave a detailed account of the situation, etc., of the nest. One glance at the case conveys a much more realistic impression of the appearance of a Snow Bunting's nest than mere words can do.—G. G. BLACKWOOD, Edinburgh.

Siberian Chiff Chaff and Holböll's Redpoll in Shetland.—Between the 21st and 31st of October last, there was a considerable arrival of migratory birds, consisting of Blackcaps, Bramblings, Goldcrests, Thrushes, Siskins, Northern Bullfinches, Chiff Chaffs and Redpolls. On the 28th Mr. Andrew Leslie, Jun., of Seafield, near Lerwick, shot two Holböll's Redpolls and a Chiff Chaff among the shrubs. I submitted these birds to Mr. Eagle Clarke for his opinion and he informs me that my suspicions as to their identification are correct, and that I am right in believing that the Siberian Chiff Chaff is new to the known avifauna of the mainland of Shetland. During the latter half of January 1911, a number of Redpolls and Greenfinches were seen here.—JOHN S. TULLOCH, Lerwick.

The Greater Wheatear in Clyde.—Whilst taking a walk near Carmunnock on 10th May of last year, on the look out for migratory birds, I noticed a number of Wheatears which looked larger than the usual variety, and obtained one for the purpose of identification. This I sent to the Royal Scottish Museum, where upon examination it turned out to be *S. leucorrhoa*, a male, with a wing measurement of 101 mm. This is, I believe, the first record for the occurrence of this large northern race in the Clyde valley. It is noticeable that Wheatears, though plentiful in the locality on the spring migration are singularly scarce on the journey south in the fall of the year.—HARRY DUNCAN, Glasgow.

[**Supposed Occurrence of the Grasshopper Warbler** (*Locustella naevia*) in “Dee.”—On the evening of 20th May 1910, while making our way homeward beside the river Dee, a few miles from Aberdeen, we were surprised by hearing a loud “reeling” bird-song, proceeding from a conifer plantation with much undergrowth among the young trees. We listened to the song for a few minutes (it was about 9 P.M.), and although neither of us had previous acquaintance with the Grasshopper Warbler, we at once recognised the well-known song from descriptions, and we record the occurrence for what it is worth.—L. N. G. RAMSAY, A. G. DAVIDSON, Aberdeen.]

Continental form of Willow Warbler and Gt. Spotted Woodpecker on the Isle of May.—In May 1909 a Willow Warbler was sent off to us which had struck the lantern on the Isle of May and so killed itself. It proves to belong to the Eastern race, *Phylloscopus trochilus eversmanni*, which, according to Dr. Hartert breeds in Northern Russia and Siberia.

The Great Spotted Woodpecker recorded by us in the “Annals of Scottish Natural History,” 1910, p. 5, as occurring on the Isle of May on the 16th of September 1909, is of the continental form, *Dendrocopus major major*. We are indebted to Dr. C. B. Ticehurst for determining these racial forms for us.—LEONORA JEFFREY RINTOUL and EVELYN V. BAXTER.

Great Spotted Woodpecker in Solway Area.—Mr. Archd. Goldie-Scot writes me that last spring he saw a Great Spotted Woodpecker near Craigmue in Balmaclellan parish, Kirkcudbrightshire. In Dumfriesshire, besides those already recorded as nesting in 1910 (“Birds of Dumfriesshire,” p. 160) I heard of one being seen near Carnsalloch (Kirkmahoe) in November 1910, and I myself saw one in Auchangibbet wood (Tynron) on 20th December 1910, not 100 yards from its nesting site of the preceding spring.—HUGH S. GLADSTONE, Thornhill, Dumfriesshire.

Short-eared Owls at Tiree.—During the early part of February 1911, when the sportsmen were here shooting Snipe and Wild-fowl, many Short-eared Owls (*Asio accipitrinus*) were seen. These, I

believe, were on their way north, and I have not observed any other migrants, as yet, to date (27th February).—PETER ANDERSON, Tiree.

Hobby and other Birds of Prey in Moray.—A Hobby (*F. subbuteo*) was killed by one of the keepers at Innes, Elgin, in the end of June last year. It was thought to be a Merlin, but was stuffed, and it was only by chance that I happened to see it, and recognised it. On enquiry I find it was shot about 6 in the evening when flying close to the ground across the pheasant rearing field. There were two keepers present at the time, and they think it was just going to lift a bird. It has a wing almost exactly 10 inches, and consequently I would put it down as a male. The keeper, however, writes it had a bare spot on the breast, and he considered that it had been sitting on eggs at the time. Innes is very well wooded and it is quite possible it was breeding there. I was away in Norway at the time, or would have seen it in the flesh, and probably would have been able to find out if there were more about. I think a good many birds of prey pass over the south side of the Moray Frith. One spring about five years ago, there was an Osprey at Lochnabo. I did not see it, but was told it stayed for a day or two. I have repeatedly seen Peregrines; indeed, I saw one almost secure a Partridge about a month ago. I also saw in 1906, about the end of October what I have no doubt was a Goshawk. It was feeding on a Water-hen, and rose within half a score of yards from me. It left its bird behind, but returned later and took it away. As this was only a couple of fields from the house, the bird could no doubt easily have been either trapped or poisoned, and perhaps if it had killed either a Partridge or a Pheasant it might have been sacrificed. As it was it was not interfered with. This year we have had a great many Merlins about, and of course with the large woods of Gordon Castle, and Lochnabo so near, there are many Sparrow-hawks. In 1907 or 1908, although the keepers thought all nests on the place had been destroyed, in the fortnight beginning the 11th August they killed 33 round places the young Pheasants were turned down within three weeks, and not without the loss of a good many birds.—J. DAVIDSON, Innes, Elgin.

Wigeon Breeding at Loch Leven: a Correction.—In our footnote to the communication which appeared in the "Annals" for January we inadvertently quoted as our authority, for the earliest breeding of this species at Loch Leven, Mr. Millais's "Wildfowler in Scotland"; it should have been the same author's "Surface-Feeding Ducks," published in 1902.—EDS.

Wigeon Breeding in Roxburghshire.—The Wigeon (*Marca penelope*), undoubtedly, now breeds regularly in Roxburghshire, but

I cannot remember having seen an authentic record of the finding of a nest. It may therefore be useful to report that on 7th May, 1910, I put a duck wigeon off her nest within the bounds of the county. The nest, which was in long heather, was about two hundred yards from a small loch situated in the higher moorlands of the county. There were eight eggs and a fair quantity of down in the nest, and incubation was probably just commencing. In the course of the day I saw three or four drake wigeon, so there were almost certainly several more nests in the vicinity.—G. G. BLACKWOOD, Edinburgh.

Capture of Marked Wigeon.—In June 1909, I marked five Wigeon (*Mareca penelope*) at Gordonbush, East Sutherlandshire, one of these was got in Holland on 3rd September 1909, and a second has turned up about the middle of January 1911, on the Trent near Retford. It is very remarkable that out of five birds marked two should have been reported.—FRANCIS G. GUNNIS, London, S.W.

Whimbrels nesting in Sutherland.—The following is not a *Record* but a *Negative*:—At a sale at Stevens (21st Feb. 1911) the eggs sold were from a dealer, and bought and paid for—cash—by an unknown purchaser. *Item*: “Whimbrels, c/3 fine green type, Sutherlandshire,” or words to that effect. All I can say about nesting of this species in Sutherlandshire I have said before, but desire to repeat, “I have never been able to authenticate any such extension to the southward of the species”; and I have utterly failed to secure a single authentication of similar statements, during forty-five years’ personal knowledge of the avi-fauna of that county or area. I think the negative is *worth repetition*.—J. A. HARVIE-BROWN.

Opah or King-fish in Mull Waters.—I am indebted to Mr. Bryce Allan Yr. of Aros for drawing my attention to the occurrence, on 8th June 1910, of a specimen of *Lampris luna* in Mull. Some whelk gatherers found one stranded in shallow water at Ardnacross, midway between Salen and Tobermory. It proved to be a female with spawn in a pretty forward state of development. Unfortunately the beautiful fish was mutilated before I could take the weight and accurate measurements.—D. MACDONALD, Tobermory.

Labia minor in Haddingtonshire.—On 16th June 1910, when passing the farm steading of “Deuchrie” at the foot of the Lammermuirs, Haddingtonshire, I caught a specimen of this small Earwig flying in the sunshine. The few previous “Forth” records are from Edinburgh and Fife. It may also be of interest to add that in August 1909, I found the common Earwig (*Forficula auricularia*) in abundance in Gannets’ nests on the Bass Rock. It is also plentiful on the Isle of May.—WILLIAM EVANS, Edinburgh.

Acherontia atropos in Caithness.—A Death's-head moth was captured in a bee-hive at Watten, Caithness, on or about the 10th of September last by Mr. Francis Doull, postmaster there, who kindly sent it to me through the Rev. David Lillie.—WILLIAM EVANS, Edinburgh.

BOTANICAL NOTES AND NEWS.

Rhinanthus Perrieri (pp. 56-7).—This name does not “express a character common to all, or nearly all, the species of a genus.” Even if it did, I would remind Mr. Druce that those words of the Vienna “Actes” occur in a Recommendation, not in a Rule; they are a guide for the future, rather than a restriction on the past. Dr. J. von Sterneck's contention in his “Monograph of *Alectorolophus*,” p. 109, is that *R. Perrieri*, Chabert, cannot be distinguished from *R. minor*, var. *rusticulus*, Chabert; the supposed difference being “inapplicable for scientific purposes,” and indeed non-existent in the original specimens of *R. Perrieri* seen by him. As he states on p. 108, *R. Perrieri* and *R. minor*, var. *rusticulus*, are synonymous; the specific must therefore supersede the varietal name. I agree that Sterneck was not “free to choose”; he ought to have written *Alectorolophus Perrieri*, instead of *A. rusticulus*.—EDWARD S. MARSHALL.

Cerastium nigrescens, *Edmonston* (pp. 40-2).—Mr. Druce has given us an excellent sketch of the plant's history; but I do not think that he has proved the above name to be valid. Edmonston first described it as *C. latifolium*, L., and subsequently as *C. latifolium*, var. *nigrescens*; rejecting in the text the name *C. nigrescens*, under which it had been mentioned in the preface to his “Shetland Flora.” In my opinion this remains a *nomen nudum*, and must be discarded on technical grounds, though his opinion of its distinctness from *C. latifolium*, L., of the Alps was correct. Even if, as is alleged by Ostenfeld, Lange included a Greenland form of *C. alpinum*, under his *C. arcticum*, that name should I think, be retained in a restricted sense for our British species, which Lange endorsed as true as *C. arcticum*; the later *C. Edmonstonii*, Murbeck and Ostenfeld, appears to be superfluous.

Mr. Druce's account of the supposed hybrids is most interesting; and I have little doubt that his conclusions are correct. Syme's unlocalised *C. alpinum*, var. *pubescens*, is too briefly described for satisfactory identification; I suspect that it was *C. alpinum* \times *arcticum*, though it may have included one or more other hybrids.—EDWARD S. MARSHALL.

Corallorhiza innata.—Mr. A. Macgregor's query respecting this species as a Moray plant seems not easy to answer. In Watson's “Outlines,” 1832, p. 279, no mention is made of Moray; Ross is given.

In the "New Botanists' Guide," 1837, p. 498, Mr. Watson says of the "Rev. G. Gordon's 'Cat. of Plants found in Moray,' a tract of country including the present county (Elgin) along with that of Nairn, and likewise parts of Ross, Inverness, and Banffshire." It is not given for Elgin here. In the "Comp. Cybele Brit., 1869, p. 323, Moray is still unnamed. In the 1st ed. of "Top. Botany," 1874, p. 374, no Elgin or Moray is named; neither are they in the 2nd ed., 1883, p. 387. The only locality at all near Moray seems to be "Contin, 8 miles from Dingwall," and Coull on the Conan river. In the "Supplement to the Compendium," 1872, p. 85, Wilson gives it for the sub-province 31, *i.e.* "Banff, Elgin, Nairn, East Inverness." Whether the records "Mr. Lawson" or "Miller" of "Top. Botany" were of stations under Moray I do not know. I have seen specimens only from Co. 68, 81, 85, 87, 90, and 92.—ARTHUR BENNETT.

***Vicia sylvatica*, L., var. *condensata*, Druce.**¹—In the "Annals" for 1910, p. 40, Mr. Druce records this from shingle north of Drummore, V.C. 74.

The late Mr. A. Somerville sent me a series of specimens from the shore-rubble north of Johnshaven, Kincardine (9. 8. 1905), which are even more condensed (especially in the non-flowering shoots) than Mr. Druce's original examples. In these Kincardine specimens the leaves are oblong, rotund, closely compacted and the edges revolute, and looking much like a small contracted form of *V. sepium*, L. Many of the leaflets are nearly as broad as long, while in typical examples they are nearly three times as long.—ARTHUR BENNETT.

***Poa palustris*, Linn. in Scotland.**—Another locality has recently been added, by Mr. James M'Andrew, to the two already known for this plant in Scotland, by his discovery near Kenmure Castle, New Galloway, of a grass which both Dr. Stapf and Professor Hackel agree in placing under this name. I have lately seen several sheets of a grass gathered by Dr. Knapp and labelled by him "*Poa nemoralis*, a variety found by me at Linn na Grach, Perthshire, 1835," which, it seems to me, might well be placed under *Poa palustris*, Linn. I am anxious to find out the whereabouts of "Linn. na Grach," "Linn. ma Gray," or "Linn. ma Grag" (as Knapp variously writes it) in order that fresh specimens of Knapp's plant may be got and submitted to present-day experts for identification. Can any reader of the "Annals" throw light on the position of that locality?—JAMES FRASER.

***Poa palustris*, L., near Aberdeen.**—In October, 1910, I found this grass growing sparingly by a farm road at Ruthrieston, just beyond the city's limits on the west side of Aberdeen. I am not aware of its having been observed in this neighbourhood before. There can be little, if any, doubt that the seeds had been thrown by

¹ "Naturalist" (1884), p. 85, and "Ex Club Report for 1883 (1884), p. 85.

the roadside, though the habitat did not seem a likely one for it even as a casual. In 1909, I found *P. Chaixii* in a neglected field of grass at Old Aberdeen, like *P. palustris* no doubt an alien.—JAMES W. H. TRAIL.

A remarkable form of *Carex aquatilis*, *Wahl.*—Mr. George West has lately sent me a series of very nice specimens of *Carex* from Scotland, acquired mostly while exploring the series of lakes he has been engaged in.¹ Among these is a most extraordinary form of *C. aquatilis*. He describes it as forming dense tufts here and there in Inchnacardoch Bay, Loch Ness, and “immediately behind the large tussocks on ground that is very wet but firm. It grows in a spreading mass, carpeting the ground with a tangle of rhizomes and roots, so dense that it is scarcely possible to get the fingers through them in order to extract a specimen. As the water is approached, and the ground becomes mere mud, this carpeting habit gives way, and the rhizomes of many plants combine together and take a vertical direction instead of a horizontal. They forsake the diageotropic habit, assume negative geotropism and become caespitose. The combined rhizomes form a sort of trunk, which is very hard and heavy, something like a tree-fern trunk. They are thus able to elevate their leaves and inflorescences above the surface of the surrounding water” (Notes on the specimens sent me by Mr. West). One of these tussocks extracted by Mr. West weighed 70 lbs. when wet. That *aquatilis* grows in considerable masses, Mr. West shows in his papers, but anything like the above I have vainly sought for.

Of the described forms in books so far as the inflorescence goes, these specimens come nearest the var. *virescens*, Anderson, *Cyp. Scandinavica* (1849), p. 46.

In another note Mr. West remarks, “These grow in large caespitose clumps forming a dense head of foliage; with the rhizome the whole clump will be 3 feet high or more. They stand out of the water, and when isolated look like miniature palms. When sufficiently abundant to be close together they form numerous little islands with mud or water between.”

Has any Scottish botanist observed anything like this with *aquatilis*? It is *aquatilis* assuming the habit of *C. Hudsonii*, Ar. Benn. (*C. stricta*, Good.).—ARTHUR BENNETT, Croydon.

Notes on *Callitriche*.—Among the many good aquatic plants gathered by Mr. G. West in his examination of the Scottish Lakes, was a fine series of *Callitriche autumnalis*, L.

The normal form was represented by many gatherings, but in others from Loch Gelly and Loch Kilconquhar, Fife (20. 9. 09), the

¹ ‘Comp. Study of Dominant Flora of Aquatic Habit, etc.,’ with 53 plates. “Proc. Roy. Soc. Ed.” (1905), p. 967.

‘Further Contributions to above, etc.,’ with 62 plates. “Proc. Roy. Soc. Ed.” (1910), pp. 63-182.

leaves are shorter and much the shape of those of *C. truncata*, Guss., the internodes shorter, and the fruit much larger, in these respects answering to the var. *lunulifera*, Norman.¹ The only fruits on other specimens approaching these are from the Loch of Watlee, Unst, Shetland; Beeby, *leg.*

A specimen from "Town-foot, Dumfries, 1887, *leg.* J. Fingland," named as *autumnalis* has much the habit of *C. truncata*, Gussone; but there is no fruit unfortunately. *Truncata* is not a northern species. In England it occurs north to Notts. In the herbarium at University College, Nottingham, are specimens gathered by Mr. Fisher in 1892.

In Europe *truncata* is not on record north of Belgium.

In some extraordinary specimens of *C. intermedia*, Hoffm., (*hamulata*, Kütz) from Ednam Bay, Loch Tay, 1905, from J. M'Andrew, the leaves are $1\frac{1}{2}$ to 2 inches long, with the apex separated into a complete claw-like end twice the width of the leaf, *C. polymorpha*, Lönnroth, "Obser. crit. pl. suec. illustrantes" (1854), p. 19.

I have seen no Scottish specimens of this other than Mr. Beeby's Shetland ones, but it should occur. In England it occurs in Surrey; Cambridge, Fyer, *sp.*; and Mr. Beeby saw it in a globe in Seven Dials, London, bought some, and sent me specimens. The dealer said the specimens came from Epping Forest, Essex.

C. obtusangula, Le Gall., "Fl. Morbihan" (1852) p. 202.

This may occur in Southern, Scotland, in Ayr, Dumfries, or Kirkcudbright, although in England its most northern stations are S. E. Yorkshire (Co. 61), and Cheshire (Co. 58). In this the fruit is longer than broad, there are no wings, and the four edges of the fruit are rounded, not angled.

There is a sub-sp. of this, *C. alpina*, Nyman = *C. transsylvanica* Schur. (*nomen*), that occurs in Transylvania, which may be more likely to occur in Scotland.

C. obtusangula is not recorded north of Belgium in Europe.—ARTHUR BENNETT, Croydon.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—January-March 1911.

[The Editors desire assistance to enable them to make this Section as complete as possible. Contributions on the lines indicated will be most acceptable, and will bear the initials of the Contributor. The Editors will have access to the sources of information under mentioned.]

ZOOLOGY.

LARGE SEAL KILLED IN BEAULY RIVER. A. R., *The Field*, Jan. 14, 1911, p. 84. Records the killing of a Seal 6 ft. 6 in. in length

² "Ind. Suppl. Loc. Nat. Species" (1864), p. 16.

and 55 in. in girth. This example afterwards proved to be an adult male Harp Seal (*Phoca grœnlandica*)—(see *The Field*, Feb. 18, 1911, p. 329, where a photograph of the animal is reproduced).

RARE SEALS IN SCOTLAND. J. G. Millais, *The Field*, Feb. 18, 1911, p. 329. Records the capture of a female grey Seal 8 ft. in length and 4 ft. 8 in. in circumference, near Herda Head, Shetland.

THE BIRDS OF EAST RENFREWSHIRE. John Robertson, *The Glasgow Naturalist*, Feb. 1911, pp. 41-59.

FLAMINGO (*PHENICOPTERUS ROSEUS*) IN CLYDE ESTUARY. John Paterson, *The Glasgow Naturalist*, Feb. 1911, p. 71. Bird reported to have been killed off Port-Glasgow.

LANDRAIL IN SCOTLAND IN MARCH. A. R., *The Field*, March 11, 1911, p. 490. Bird seen on 3rd March at Bogroy, near Inverness.

LAND AND FRESHWATER MOLLUSCA OF ROSS-SHIRE, WITH SOME NEW COUNTY RECORDS. J. W. Vaughan, *Journ. of Conchology*, Jan. 1911, pp. 147-148. A list of 19 species given, 11 of which are new to the county.

LIMAX TENELLUS, MÜLL., IN PERTH EAST. Chas. Oldham, *Journ. of Conchology*, Jan. 1911, p. 148. Found on Oct. 6, 1910, in abundance at Pitlochry.

VITREA RADIATULA (ALDER) IN DUMBARTONSHIRE. J. R. le B. Tomlin, *Journ. of Conchology*, Jan. 1911, p. 148. Specimen collected by the late Dr. Boog Watson at Cardross.

ON THE OCCURRENCE OF UNIO SINUATUS, LAM., IN THE BRITISH ISLES. J. Wilfrid Jackson, F.G.S., *Journ. of Conchology*, Jan. 1911, pp. 142-143. Specimen from river Clouden in South-west Dumfriesshire, taken in 1865, was discovered by the author in an old collection and found to be the true *sinuatus* of Lamarck. Specimens previously recorded under this name should in future be known as *elongata*, Lam., and referred to the genus *Margaritana*.

TWO SPECIES OF COLEOPTERA NEW TO SCIENCE. Norman H. Joy, M.R.C.S., F.E.S., *Ent. Mo. Mag.*, Jan. 1911, pp. 10-12. *Thinobius bicolor*, sp.n. described from three specimens taken at Dalwhinnie, Inverness-shire, on May 1, 1910.

HELOPHORUS TUBERCULATUS, GYLL., NEAR COATBRIDGE, N.B. George A. Brown, *Ent. Mo. Mag.*, March 1911, p. 68. Two specimens taken last July.

BLEDIUS PALLIPES AND ITS ALLIES IN BRITAIN. D. Sharp. M.A., F.R.S., *Ent. Mo. Mag.*, Feb. 1911, pp. 31-34. Several Scottish records are given in this paper.

FURTHER RECORDS OF BLEDIUS ANNÆ, ETC. Norman H. Joy, *Ent. Mo. Mag.*, March 1911, p. 65. *B. annæ* taken at Pitlochry, Sept. 1909; and *B. pallipes* on the banks of the river Tummel.

MYCETOPHAGUS QUADRIGUTTATUS, MÜLL., IN SCOTLAND. George A. Brown, *Ent. Mo. Mag.*, March 1911, p. 68. Found in a stable at Coatbridge. Several other species of Coleoptera, whose names are given, were taken with it.

A LIST OF DIPTERA COLLECTED IN PERTHSHIRE. A. E. J. Carter, *Trans. and Proc. Perthshire Soc. Nat. Sci.*, vol. v. part ii. (1909-10), pp. 51-54. A list of 79 species, of which 21 are new to the county.

DIPTERA IN PERTHSHIRE. A. E. J. Carter, *Ent. Mo. Mag.*, March 1911, pp. 69-70. A long list of species taken at Blairgowrie, Kirkmichael, etc.

NOTE ON HALESUS GUTTATIPENNIS, M'L. K. J. Morton, *Ent. Mo. Mag.*, Jan. 1911, p. 19. A number seen near Ormiston, East Lothian, Nov. 4, 1910. *Chætopteryx villosa*, *Leuctra klapálecki*, and *Elipsocus abietis* are also recorded from the same locality.

HALESUS GUTTATIPENNIS IN SCOTLAND IN OCTOBER. William Evans, *Ent. Mo. Mag.*, Feb. 1911, p. 43. Specimen taken at East Linton on 15th October, 1910.

NOTES ON SOME ECTOPARASITES IN THE MUSEUM, PERTH. James Waterston, B.D., B.Sc., *Trans. and Proc. Perthshire Soc. Nat. Sci.*, vol. v. part ii. (1909-10), pp. 48-50. Ten species are dealt with, and all the records are Scottish.

NOTES FROM THE GATTY MARINE LABORATORY, ST. ANDREWS. No. XXXII. Prof. M'Intosh, M.D., LL.D., F.R.S., *Ann. and Mag. Nat. Hist.*, Feb. 1911, pp. 145-173, pls. v-vii. In Section 3, on "The British Cirratulidæ," several Scottish species are recorded and described.

BOTANY.

DAVID DOUGLAS, SCONE, BOTANIST AND PIONEER OF ARBORICULTURE. By R. Dow (*Trans. P.S.N.S.*, 1910, v. 55-65, Pls. 6-7).

PRESIDENTIAL ADDRESSES TO PERTHSHIRE SOCIETY OF NATURAL SCIENCE. By W. Barclay. In Nov. 1909 (*Proc. P.S.N.S.*, 1909, lxi-lxix). The excursions of the Society in 1909 are described (to Glen Tarken, Killiecrankie, Ben Chonzie, etc.), with mention of rarer plants. In March 1910 (*l.c.* lxxiii-lxxvii), on *Our Alpine Flora*—a discussion of the conditions that may explain its distribution.

THE PRESENT POSITION OF BOTANICAL SURVEY IN BRITAIN. By Wm. G. Smith, B.Sc., Ph.D. (*Trans. Bot. Soc. Ed.*, 1909, xxiv. 53-59).

THE FLORA OF BUCHAN. By J. W. H. Trail (*The Book of Buchan*, 1910, pp. 44-47). A statement of work requiring to be done in Buchan.

PERTHSHIRE ROSES. By William Barclay (*Trans. P.S.N.S.*, 1910, v. 66-74). A list of all Perthshire forms known to him.

FUNGI FROM PERTHSHIRE. Exhibited (*Proc. P.S.N.S.*, 1909, lix.).

CHÆROPHYLLUM AUREUM, L., FROM BANK OF TEITH, CALLANDER, in 1907. Exhibited by James Fraser (*Proc. Bot. Soc. Ed.*, 1910, xxxi.).

NOTES ON THE BRITISH SPECIES OF UTRICULARIA. By Arthur Bennett (*Trans. Bot. Soc. Ed.*, 1910, xxiv. 59-63).

THE GENUS CAREX IN BRITAIN. By Arthur Bennett (*Trans. Bot. Soc. Ed.*, xxiv. 77-84). Critical remarks on many of the species and varieties.

CAREX AQUATILIS, WAHLB., AND ITS SCOTTISH FORMS. By Arthur Bennett (*Trans. Bot. Soc. Ed.*, xxiv. 86-90). A very full account.

SOME FURTHER MOSSES AND HEPATICS FROM THE ISLE OF MAY. By William Evans, F.R.S.E. (*Trans. Bot. Soc. Ed.*, xxiv. 91-93). Adds 17 Mosses and 2 Hepatics.

THE DISTRIBUTION OF HEPATICÆ IN SCOTLAND. By Symers M. Macvicar (*Trans. Bot. Soc. Ed.*, xxv. 1-336).

SCOTTISH PEAT-MOSSES. A CONTRIBUTION TO THE KNOWLEDGE OF THE LATE QUATERNARY VEGETATION AND CLIMATE OF NORTH-WESTERN EUROPE. By G. Samuelson (*Bull. Geol. Instit. of Upsala*, 1910, x. 197-260, 1 map).

NEW LICHENS. By A. Lorrain Smith (*Journ. Bot.*, 1911, 41-44). Descriptions of several species and varieties new to science, of which one, named *Arthopyrenia Crombiei*, sp.n., was found by J. M. Crombie on bark by the Garry at Blair Atholl, Perthshire (V.C. 89).

FOUR SPECIES OF GEASTER COLLECTED IN EAST LoTHIAN IN OCTOBER 1909. Exhibited by Wm. Evans (*Proc. Bot. Soc. Ed.*, 1909, xxiii.).

TWO NEW SPECIES OF MYCETOZOA. By G. Lister (*Journ. Bot.*, 1911, 61-62). *Licea castanea*, n.sp., on bark of *Pyrus Aucuparia* and moss on the bark, Lesmoir, Aberdeenshire (V.C. 93), found by Rev. W. Cran—described.

BOOK NOTICES.

THE WORKS OF ARISTOTLE, translated into English. . . . Vol. IV. *Historia Animalium*. By D'Arcy Wentworth Thompson. (Oxford: Clarendon Press, 1910.)

Professor D'Arcy Thompson's translation of Aristotle's *History of Animals* will be welcomed by all who know his valuable "Glossary of Greek Bird Names," published in 1895. Naturalists and classical scholars alike are in debt to the Professor for his "Glossary": the present work will prove of special value to those who are interested

in tracing the steps by which the attitude of mankind towards nature has been transformed from one of childlike wonder, expressing itself largely in myth and fable, to one of mature admiration and progressive comprehension, expressing itself in accurate description, scientific classification and reasoned theory. Apart from the element of myth—which has not yet wholly vanished from the “popular science” of our own day—the special interest of Aristotle’s work lies in such broad and illuminating general statements as that the habits of animals are all related to the securing of progeny and the securing of food, or that “there is enmity between such creations as dwell in the same localities or subsist on the same food”: in such vivid descriptions as that of the Wryneck, which “is somewhat bigger than the Chaffinch, and is mottled in appearance . . . is peculiar in the arrangement of its toes, and resembles the snake in the structure of its tongue . . . can protrude its tongue to the extent of four finger-breadths and then draw it back again . . . and can twist its head backwards while keeping all the rest of its body still like the serpent” . . .; and in the anatomical details to be found, most notably, in the accounts of Cetaceans and Cephalopods. The Professor has been very successful in giving a clear rendering of Aristotle’s Greek, and his notes both on text and matter are of great value in elucidating obscure and often corrupt passages; the table of contents and the index will be found very useful. It is doubtful whether anyone else living could have performed precisely the service for English-reading men of science which Professor Thompson has so efficiently rendered in the work under review.—H. J.

A MONOGRAPH OF THE BRITISH NUDIBRANCHIATE MOLLUSCA. Part VIII. (Supplementary). Figures by the late Joshua Alder and the late Albany Hancock, and others. Text by Sir Charles Eliot, M.A., D.C.L., etc. Folio, pp. 198, with 8 coloured plates. Ray Society, 1910.

This is an important work, and supplies a real want long felt by all interested in that section of our marine fauna to which it relates. Alder and Hancock, it appears, contemplated the publication of a supplement to their celebrated Monograph, but did not live to carry out their purpose. They left, however, a number of drawings and some notes, the former of which have formed the basis of the present Part. The text is entirely from the pen of Sir Charles Eliot, who is a recognised authority on the Nudibranchiata.

Besides the systematic portion, which includes descriptions of species added to the fauna of the British Isles since the issue of Part VII. (1855), and a fresh Synopsis of families, genera, and species, there are valuable chapters on Variation and Distribution, Nomenclature, Bionomics, Embryology and Larval Stages, Anatomy, Classification, and Affinities and Relationships. In the matter of nomenclature, Sir Charles Eliot is not one of those extremists who

insist on applying the priority rule in every case, regardless of prospective inconvenience and confusion. "I confess," he writes, "that I sympathise with those zoologists who wish to be as conservative as possible in applying the rule of priority. It is a mere means for conveniently deciding disputed cases, not a moral law which must be enforced whether convenient or not. . . . I cannot see that anything is gained, whereas much is obviously lost, by discarding a well-known name in favour of an obscure and forgotten one, when there is practically no competition between them." Neither is he a "splitter," being inclined, rather, to consider that the creation of genera and species is at times carried too far. An extensive Bibliography for the period since 1855 follows the Synopsis. From the long list of citations we miss, however, the following Scottish faunal works in which Nudibranchiates are included; Leslie and Herdman's "Invertebrate Fauna of the Firth of Forth," 1881, and the British Association "Handbook of the Fauna, Flora, and Geology of the Clyde Area," 1901.—W. E.

REPORT ON THE IMMIGRATION OF SUMMER RESIDENTS IN THE SPRING OF 1909; ALSO ON MIGRATORY MOVEMENTS DURING THE AUTUMN OF 1908. Bull. Brit. Orn. Club. Vol. xxv. 6s. net.

This is the fifth annual report of the Committee of the British Ornithological Club on this subject which has been noticed in our pages. It is based upon the same lines as those previously dealt with, and hence does not call for more than a few words. We must remark, however, that it is a much more bulky volume than any of its forerunners, and extends to no less than 347 pages. It bears evidence of having been carefully prepared, and should certainly be studied by all interested in bird-migration as observed in the British Isles.

THE BRITISH WARBLERS. By H. Eliot Howard. Illustrated by Henrick Gronvöld. Part V. London: R. H. Porter. 21s. net.

This, the initial instalment of Volume II. of this very beautiful book, like its predecessors, commands most favourable notice. In it the high standard of the text for originality and interest, and of the plates for their beauty is fully maintained. The text consists chiefly of an exhaustive account of the habits of the Reed Warbler, to which no less than sixty-one pages are devoted. There are five coloured portraits, an equal number of photogravure plates depicting habits, and six maps illustrating seasonal distribution.—G. G.-M.

THE DISTRIBUTION OF HEPATICÆ IN SCOTLAND. By Symers M. Macvicar. (Transactions of Edinburgh Botanical Society, 1910. vol. xxv. 336 pp.)

Though issued as a volume of "Transactions," this is really an independent work, and is one of the most important that has appeared for some time on any branch of the flora of Scotland.

Its value is much increased by its being in every part based

on personal knowledge, all except a few of the gatherings on which the results are based having been examined by the author. The labour involved in this must have been very great, as the entries under the vice-counties are often numerous.

A short history of the progress in the study of the Hepaticæ in Scotland is followed by consideration of the effects of rainfall and climate on their distribution, and on the expression of this in the numerous "Atlantic species" in our flora, while a few prefer the eastern side of the country. The preferences for certain habitats (rocks, trees, peat-mosses, etc.) are discussed, and the altitudes attained are stated, lists being furnished of those that pass 4000 ft., and of those that reach heights between 4000 and 3000 ft. and between 3000 and 2000 ft., about half our species passing 2000 ft.

A comparison of the Hepatic flora of Scotland with those of other countries is of much interest. It is followed by a sketch of the flora of the Watsonian Provinces of Scotland, a definition of the sub-provinces and vice-counties, and an indication of the collections and other sources of information used by the author. The greater part of the work (pp. 51-330) is devoted to a detailed account of the distribution of the species, with mention under each species of the localities in which it has been found and the name of the discoverer in each locality from which Mr. Macvicar has seen specimens. Often the altitudes attained are noted under the several localities. For each species there is a short statement of the general type of its distribution, its preferences as to habitats, soils, altitudes, and any other features of œcological importance. An index to the species and synonyms completes an excellent piece of work, for which the author well deserves the thanks of all who are interested in the flora of Scotland.

THE LIVERWORTS BRITISH AND FOREIGN. By Sir Edward Fry, G.C.B., and Agnes Fry. (London: Witherby & Co., 326 High Holborn, W.C., 1911.)

This little book will be found an excellent introduction to the study of a most interesting group of plants, in which important questions are raised on the relations between the lower and higher forms of plant life. Selected examples afford occasion to discuss the leading types of structure met with among Liverworts and the provision for securing a due supply of water. The outlines of classification and of distribution over the earth's surface are briefly but clearly given; and the book closes with a short notice of the most helpful works on the Liverworts.

Incidental references to the flowering plants lead to statements that may be revised in a future edition, such as the comparison of the antheridia of Liverworts with the stamens of flowering plants (p. 6). But such matters do not affect the value of the work, which is excellently fitted to serve its end.



The Annals of Scottish Natural History

No. 79]

1911

[JULY

IN MEMORIAM: ROBERT SERVICE.

BY the death of Robert Service, the "Annals of Scottish Natural History" loses one of its most valued contributors. It will always be regretted that he did not live long enough to publish a Fauna of the Solway Area, a district with which he was so intimately acquainted. His published notes on the subject testify to his knowledge, not only of its Ornithology, but of its Zoology generally, gained by personal observations in the field. He was rightly regarded as *the* local authority on Natural History and Botanical matters, and as such was the friend and correspondent of authorities like Professor Alfred Newton, William Lennon, Rev. H. A. Macpherson, Howard Saunders, Major Barrett Hamilton, Professor G. F. Scott-Elliot, W. Eagle-Clarke, J. A. Harvie-Brown, W. Evans, and many others. His generosity in giving specimens to those who would appreciate them was widespread, and the Royal Scottish Museum, Edinburgh, contains many of his donations; of which, perhaps, the Whiskered Tern, shot near Dumfries in 1894, is the most prized.

Robert Service was born on 23rd May 1854, at Netherplace near Mauchline, Ayrshire. His father, four years after his birth, set up as a nurseryman at Greenbrae, near Dumfries, and Robert received his education at the Old Free Kirk School, Maxwelltown. After completing his education there, he joined his father in the business which he

was to follow all his days. From his childhood his inclinations led him to study Nature, and any moments that he could spare from his work were devoted to this pursuit. His note-book was ever ready to jot down any observations he might be able to record during the day, and when night came he was often to be found studying the stars at the Maxwelltown Observatory. He did much to reorganise the Dumfriesshire and Galloway Natural History and Antiquarian Society when in 1876 it had fallen into abeyance; and at this period he was appointed Secretary. In 1879 he married a daughter of Mrs. Glendinning of Glasgow Street, Maxwelltown, and three years later he was called upon to make a decision which must have indeed been difficult. Joseph Thomson, the African traveller, had been commissioned to undertake an exploration of Eastern Africa for the Royal Geographical Society, and invited him to act as Naturalist to the expedition; his sense of duty overcame his desire, and Robert Service stayed at home.

His knowledge of Natural History was utilised in 1892 when he gave evidence before the Commission appointed to investigate the Plague of Field Voles in Scotland, and also in 1895 when he appeared as a witness before the Solway Fisheries Commission. On 23rd February 1901 his astronomical studies were all but rewarded by the discovery of a new star, which, however, had been observed by Dr. Anderson of Edinburgh a few hours earlier. At his father's death in October, his business became even more engrossing, though in 1903 he was persuaded to undertake the honorary duties of Secretary and Curator to the Dumfries and Maxwelltown Observatory Museum, and held these posts for seven years. He took a keen interest in politics, being a staunch Conservative; and more than once he served on the Town and Parish Councils. He was in constant request at Horticultural Shows, and he judged the roses at the Royal Caledonian Horticultural Society's Exhibition only the summer before his death. Overwork was undoubtedly the cause of the attack of paralysis which eventually proved fatal to him on 8th May 1911. Three days later he was laid to his rest in Troqueer Kirkyard, being survived by his wife, two sons, and three daughters.

I have already had to perform the melancholy task of writing my friend's obituary for "British Birds" magazine, and I have there referred to the example which Robert Service has left us "of generosity, of a stern sense of duty, of an untiring energy, of patient and loving study of the beauties of Nature."

Besides being a constant contributor to the Transactions of many Societies, Robert Service's papers often appeared in the "Scottish Naturalist," the "Annals of Scottish Natural History," and the "Zoologist." To give a complete list of his papers is here impracticable; but the following are perhaps some of the most valuable:—

- 1885. Disappearance of the Chough (*Pyrrhocorax graculus*, L.) from the Stewartry of Kirkcudbright. (Read 28th April 1885.) "Proceedings and Transactions of the Natural History Society of Glasgow," N.S. vol. i. (1883-1886), pp. 117-122.
- 1887. On the Former Existence of Ptarmigan in South-West Scotland. "Zoologist," 1887, pp. 81-89.
- „ Wild White Cattle in South-Western Scotland. *Op. cit.* 1887, pp. 448-457.
- 1891. The Old Fur Market of Dumfries. "Scottish Naturalist," vol. xi. 1891, pp. 97-102.
- 1892. Freshwater Fishes of the Solway Area. "Annals of Scottish Natural History," 1892, pp. 18-25.
- 1893. Distribution of the Alpine Hare in South-West Scotland. "Zoologist," 1893, pp. 265-266.
- 1894. Occurrence of Whiskered Tern in Solway. "Annals of Scottish Natural History," 1894, pp. 179-181.
- „ *Charæa graminis* in Southern Scotland. "Entomologist," xxvii. pp. 278-282.
- 1895. The Starling in Solway. "Annals of Scottish Natural History," 1895, pp. 92-96.
- 1896. Mammals of Solway. *Op. cit.* 1896, pp. 201-210.
- „ The Aculeate Hymenoptera of Mid-Solway, in the "Flora of Dumfriesshire" by G. F. Scott-Elliot, 1896, pp. xiv-xxii.
- 1901. The Vertebrates of Solway: A century's changes. (Printed for private circulation.) 12mo. 23 pp. [A reprint (with introduction added) of his paper read on 16th Nov.

- 1900, published in the "Transactions of the Dumfriesshire and Galloway Natural History and Antiquarian Society," 1906. N.S. vol. xvii. pp. 15-31.]
1902. The Adder in Solway. "Annals of Scottish Natural History," 1902, pp. 153-162.
- " The Vertebrate Zoology of Kirkcudbrightshire [revised] in Maxwell's "Guide Book to the Stewartry of Kirkcudbright," 7th edition, 1902, pp. 193-215.
1903. Colour Variations in Solway Mammals. "Annals of Scottish Natural History," 1903, pp. 65-69.
- " Bird Migration in Solway. *Op. cit.* 1903, pp. 193-204.
1905. The Sylviidae of Solway. (Read 23rd Feb. 1904.) "Transactions of the Natural History Society of Glasgow," 1905. N.S. vol. vii. pp. 137-147.
- " The Rarer Birds of the Solway Area, 1905. 8vo. pp. 1-15. (A reprint of his paper read before the Dumfriesshire and Galloway Natural History and Antiquarian Society, 20th April 1905.) See also "Transactions of the Dumfriesshire and Galloway Natural History and Antiquarian Society," 1906, pp. 423-435.
1906. The Waders of Solway. (Read 28th Nov. 1905.) "Transactions of the Natural History Society of Glasgow," 1905-1906. N.S. vol. viii. pp. 46-60.
- " Diurnal and Nocturnal Raptorial Birds of the Solway Area. (Read 18th Dec. 1903.) "Transactions of the Dumfriesshire and Galloway Natural History and Antiquarian Society," 1906. N.S. vol. xvii. pp. 327-339.
1911. Notes on the British Starling. (Read 28th Jan. 1910.) *Op. cit.* 1911. N.S. vol. xxii. pp. 100-103.

H. S. G.

ON THE OCCURRENCE OF THE NIGHTINGALE (*LUSCINIA MEGARHYNCHOS MEGARHYNCHOS*) ON THE ISLE OF MAY: AN ADDITION TO THE AVI-FAUNA OF SCOTLAND.

By EVELYN V. BAXTER, H.M.B.O.U., and LEONORA JEFFREY
RINTOUL, H.M.B.O.U.

ON the morning of the 9th May 1911 from one o'clock till daybreak there was a rush of Warblers and other birds to the lantern on the Isle of May, and on going round the

island later in the day we found that many migrants had arrived. While beating one of the patches of rhubarb a bird was flushed ; we succeeded in securing it with some difficulty, and to our delight saw that we had got a Nightingale. On comparing it with the description in Dr. Hartert's invaluable book on Palæarctic birds we decided that it was the Southern Nightingale (*Luscinia megarhynchos megarhynchos* = *Daulias luscinia* of Saunders and other authors), which, though it breeds in many parts of England, has not hitherto been proved to occur in Scotland. This identification was confirmed by Mr. Eagle Clarke to whom we submitted the specimen, which we have presented to the Royal Scottish Museum. We were interested to find that the weather conditions in which the Nightingale arrived, were exactly those in which Gätke noted the arrival of this species on Heligoland. He writes : " Solitary examples of the Nightingale arrive in Heligoland from about the middle of April to the middle of May, with light southerly or south-easterly winds, especially if these are accompanied in the early hours by a fine light rain."

Our bird appeared in precisely similar weather ; it was in good plumage and proved to be a male in breeding condition and quite fat. About 4 A.M. on the 9th we heard a bird singing which at the time we said sounded like a Nightingale, and as many of the other migrants sang when on the island it is probable that the song really was that of this bird.

REPORT ON SCOTTISH ORNITHOLOGY IN 1910.

Compiled by LEONORA JEFFREY RINTOUL, H.M.B.O.U., and
EVELYN V. BAXTER, H.M.B.O.U.

IT is very gratifying to be able to record a considerable increase in the number of observers, who have been kind enough to send schedules and notes for the Report this year. Much credit is due to all those who have, so ungrudgingly, given time and trouble to supply information, and we thank them most heartily and hope they will all

continue to render their valuable assistance. We have, of course, included our own notes from the Isle of May and elsewhere. Our thanks are due—in the northern group of localities to William Crowe, North Unst; Dr. Edmonston Saxby, Baltasound; James F. Combe, Whalsay Skerries; John S. Tulloch, Lerwick; George W. Russell, Lerwick; Rev. J. Waterston, Ollaberry; Her Grace the Duchess of Bedford, Fair Isle, etc.; William Eagle Clarke, Fair Isle; William Wards, North Ronaldshay; Thomas Budge, South Ronaldshay; M. Spence, Deerness; The Lightkeepers, Sule Skerry; John Bain, Pentland Skerries; Lewis Dunbar, Thurso; and William A. Tulloch, Cape Wrath. In the Eastern group—to W. Mackenzie, Dalmore; Thomas Allan, Tarbetness; Annie C. Jackson, E. Ross; J. Davidson, Elgin; A. Landsborough Thomson, Aberdeen; L. N. G. Ramsay, Aberdeen; Arthur G. Davidson, Aberdeen; R. M. Anderson, Girdleness and Flannans; D. Macdonald and J. Macpherson, Montroseness; Hon. G. Graham Murray, Perthshire; M. Sanderson, Bell Rock; William Berry, Tayfield; J. H. Gaskell, E. Fife; Charles Cook, Windygates; Andrew Harley, Kirkcaldy; Norman Johnston, Sinclairton; J. A. Harvie-Brown, Dunipace; William Evans, Edinburgh; Hugh Mackay, Edinburgh; Dr. Thomas Dewar, Edinburgh; Reginald Page, Edinburgh; G. G. Blackwood, Edinburgh; John Campbell, and Messrs. M'Lellan, Braid, and Stevenson, Bass Rock; S. E. Brock, Kirkliston; William F. Little, West Calder; Rev. H. N. Bonar, Saltoun; R. L. Ritchie, Tranent; and John Dishon, Barnsness. In the Western group—to Robert Clyne, Butt of Lewis; T. E. Arthur, Tiumpnanhead and North Ronaldshay; Thomas S. Campbell and J. D. Macgilvray, Flannans; Malcolm Macdonald, Barrahead; Lady Fowler, W. Ross, D. Macdonald, Tobermory; Peter Anderson, Tiree; John Muir, Skerryvore; C. H. Alston, Loch Awe; B. S. Macmichael, Craignish; George Stout, Glasgow; H. Duncan, Glasgow and Mull; James Bartholomew, Beattock; and John Craig, Beith. In the Southern group—to Hugh S. Gladstone, Capenoch; J. Murray, Dumfriesshire; J. G. Gordon, Wigtownshire; James M'Culloch, Little Ross Lighthouse, and Barrahead; John Macleod, Little Ross Lighthouse; John B. Henderson,

Mull of Galloway; and also to George H. Smith, S.S. "Goldseeker."

We have to thank Mr. John Paterson for reprints of papers from the "Glasgow Naturalist."

The following references will be used throughout this Report 1 = "Ann. Scot. Nat. Hist.," 2 = "Glasgow Naturalist." 3 = "British Birds" (magazine).

SPECIES AND SUB-SPECIES NEW TO SCOTLAND.

The year 1910 was an eventful one for Scottish Ornithology as, thanks mainly to the splendid work done on Fair Isle and St. Kilda, no fewer than eleven species and sub-species have been added to the list of Scottish birds. The first Scottish specimen of the Rock-thrush (*Monticola saxatilis*) is recorded from the Pentland Skerries (Orkney), where a beautiful adult male was captured on 17th May, another bird of this species being seen there the same day (1.1910.148). This is the second authenticated instance of the occurrence of this bird in Britain. A very interesting visitor from the East recorded this year in Scotland is Blyth's Reed-Warbler (*Acrocephalus dumetorum*) which occurred on Fair Isle in September. It is the first time this bird has been found in Britain, or, in fact, in Western Europe (1.1911.70).

The lonely islet of St. Kilda was visited in the autumn of 1910 by a Marsh Warbler (*Acrocephalus palustris*). This bird breeds in southern England (though very locally) as well as in many parts of the Continent, but this is the first time it has been recorded in Scotland (1.1911.52). The Pentland Skerries are again to the fore in the case of Temminck's Grasshopper or the Lanceolated Warbler (*Locustella lanceolata*). This Eastern Warbler was procured on 26th October, and is the first recorded for Scotland and second for Britain (1.1911.71).

Another bird new to Britain falls to be recorded this year, viz. the American Pipit (*Anthus spinoletta pensilvanica*), which occurred on St. Kilda in autumn (1.1911.52). The only previous authenticated instances of the occurrence of this Pipit in Europe are two procured by Gätke on

Heligoland. According to Dr. Hartert it breeds in sub-arctic North America, from Greenland to Alaska, wintering in the Gulf States, Mexico, and Central America.

Two Redpolls were added to the Scottish list this year; they came to our shores with the great rush of Mealy Redpolls which took place this autumn. Thus the Hoary Redpoll (*Acanthis hornemannii exilipes*) was procured on Fair Isle (1.1911.53), while Holböll's Redpoll (*Acanthis linaria holboellii*) occurred in some numbers in Scotland. Specimens of the last-named race were procured in October at the Isle of May, Tranent, near Lerwick, near Skateraw, at Musselburgh, Leith Docks, Bo'ness, the Braid Hills, at Fair Isle. Neither the Hoary nor Holböll's Redpoll had been recorded for Scotland till 1910, though a specimen of the latter bird was procured near Edinburgh, and figured by Selby in 1825 as a Mealy Redpoll (Evans, "Proc. Roy. Phys. Soc." xviii. 203). Both breed in the north of the Nearctic and Palæarctic regions. Another American bird was added to the Scottish list this year, namely the Yellowshank (*Totanus flavipes*), a specimen of which was procured on Fair Isle (1.1911.53). This species is widely distributed in America and has rarely occurred in England, and this is the first time it has been recorded for Scotland.

During 1910 three continental forms of birds of which we have British sub-species, have been recorded in Scotland for the first time. A Redbreast sent from the Isle of May on 22nd October proved to be *Erithacus rubecula rubecula*: this was a later arrival than those pronounced by Dr. Hartert to be *E. r. melophilus*. Seven Goldcrests procured on the Isle of May between 10th September and 17th October were the continental *Regulus regulus regulus* (1.1911.3). A continental Great Tit (*Parus major major*) was procured on the Isle of May on 15th October (1.1911.3), and another was secured on Fair Isle on 17th November (1.1911.53). A Great Tit that appeared on North Unst (Shetland) on 25th October probably also belonged to this race. For the sake of completeness we will mention here the first Scottish records of the continental Song-Thrush (*Turdus philomelos philomelos*) and the

northern Willow Warbler (*Phylloscopus trochilus evermanni*), both from the Isle of May in 1909 (1.1911.2 and 116).

BIRDS NEW TO FAUNAL AREAS, AND UNCOMMON VISITORS.

A goodly number of uncommon visitors are recorded in 1910. The first Greater Wheatear (*Saxicola ananthe leucorhoa*) recorded for "Clyde" was procured near Carmunnock on 10th May (1.1911.116), and the first record of this bird for Argyll and the Inner Hebrides comes from Tiree on 8th October (1.1911.52). The Black Redstart (*Phœnicurus ochruros gibraltariensis*) occurred on two separate days in spring on Fair Isle while one is reported as having been seen at Scarnish, Tiree, on the 4th November. It has not been recorded before from this faunal area. At Fair Isle the Red-spotted Blue-throat (*Luscinia svecica*) appeared in some numbers in spring, both males and females being recorded. On the 14th May one occurred near Carmyle in the Clyde Valley, this being the second Scottish mainland record for spring and the first record for "Clyde" (1.1910.182). Only one is noted in autumn, on the Isle of May on 10th September (1.1911.2). The White-spotted Blue-throat (*Luscinia svecica cyanecula*) visited Fair Isle; this is the second record of this bird for Scotland, the first having been procured on Fair Isle in 1909.

The only Warblers to come under this heading are an Icterine Warbler (*Hippolais icterina*) got near Lerwick on 15th May, and the Siberian Chiff-chaff (*Phylloscopus collybita tristis*). The first record of this bird for "Forth" comes from the Isle of May on 16th October (1.1911.3), several are recorded from Fair Isle in autumn, one was shot at Seafield near Lerwick on the 28th of October (1.1911.115), and other Chiff-chaffs seen there about the same date were probably *tristis*. Not a single Barred nor Yellow-browed Warbler is recorded this year, a very different state of matters from what obtained in 1909. It may possibly be accounted for by the great difference in the weather conditions during September and early October in the years under notice.

The Blue-headed Wagtail (*Motacilla flava flava*) and the Grey-headed Wagtail (*Motacilla flava borealis*) appeared at Fair Isle. Only one Golden Oriole (*Oriolus oriolus oriolus*) is reported this year, a fine adult male being found dead, but quite fresh, in an old wooded quarry near Dhuloch House, Inverkeithing (W. Fife), on the 16th May (1.1910.182). There are several records of Waxwings (*Bombycilla garrulus garrulus*) in 1910; a male was observed at Edrom (Berwickshire) on the 12th November ("Field," 19th Nov.). A Waxwing was captured at Tranent (Haddingtonshire) on 25th November (1.1911.54), while another was seen at the same place on 17th December. A male was found dead at Kinloch Lodge (Sutherland) on the 7th December, and during this month one was killed near Gilmerton (Mid-Lothian) (1.1911.114) and another shot near Kirriemuir (Forfarshire) (1.1911.114).

One of the features of the year was a great immigration of the Northern Bullfinch (*Pyrrhula pyrrhula pyrrhula*). On 22nd October a beautiful male and the wings and tail of a female were sent from the Isle of May (1.1911.4); these are the first recorded for "Forth." On the 23rd three males were seen in a garden at Leog, Lerwick (3.iv.211), two males and a female at Helensdale, near Lerwick (3.iv.211), and another at Hayfield in the same vicinity. On the 24th and 25th single birds are recorded on Fair Isle, and next day a male and female were sent from the Isle of May (1.1911.4). On the 27th two were seen on Fair Isle, others on the 29th, on which day Mr. Evans records a fine male caught at Archerfield (E. Lothian) (1.1911.113). A Bullfinch which rested some time at Barnsness Lighthouse on 31st October probably belonged to the Northern race (1.1911.113). On the 2nd of November a number were seen on Fair Isle and another male was received from the Isle of May (1.1911.4). On 7th November one is recorded from Baltasound (N. Unst) and on the 10th one from Fair Isle. No more come under notice till the 20th when one was shot at Lerwick, and on the 21st a female was procured at the Burn of Grenisla, near that place, while a "Russian" Bullfinch was caught near Berwick-on-Tweed in the end of the month (1.1911.114). Late in autumn a male and female were procured near Ceres

(Fife), this being the first record for "Tay," and others of this race were caught near Kirkcaldy. On 18th December two males were seen at Lerwick.

The only record of the Scarlet Grosbeak (*Carpodacus erythina*) comes from the Isle of May, a young male in green plumage being procured there on the 7th September (1.1911.4). The second record of the Two-barred Crossbill (*Loxia leucoptera bifasciata*) for the Outer Hebrides comes from the Flannans, one having been procured there on the 14th of August.

There are several spring records of the Ortolan Bunting (*Emberiza hortulana*) on Fair Isle; one was seen there in autumn, while one was seen on the Isle of May on 20th September, and three on 16th October (1.1911.4). A young female Lapland Bunting (*Calcarius lapponica*) was secured there on 5th October; it had been seen on the island the previous day and is the first authenticated record of this species for the Forth area (1.1911.5). Two were seen at Baltasound (N. Unst) on 30th October. A Wood-lark (*Lullula arborea*) arrived on the Isle of May on 16th October, and is an addition to the Forth fauna (1.1911.5). Single birds are twice reported late in autumn on Fair Isle, and from the same station comes the only record of a Shore-lark (*Eremophila alpestris*).

At Auchanbrac, seven miles north of Thornhill, Dumfriesshire, a Roller (*Coracias garrulus*) was procured on 23rd June, after having been seen there for three or four days. It proved to be a female, but not in breeding condition; the stomach contained the remains of flies and beetles' wings ("Birds of Dumfriesshire," p. 166). Quite a number of Hoopoes (*Upupa epops*) are recorded this year. One frequented Fair Isle for two consecutive days in spring, while in autumn this species is reported from Baltasound (N. Unst) on 12th, 19th, and 24th September, and from Kingsdale House (Fife) and the Isle of May (1.1911.5) simultaneously on 1st October; in the two last cases the birds stayed a day or two. A male was caught at Pitlochry on 19th October ("Scotsman"), and single birds are again reported from Fair Isle. One of the Hoopoes which was procured had its crop full of the larvæ of the

Pill-beetle (*Byrrhus pilula*); all were decapitated, but the heads were there too.

It will be remembered that in December 1909 a number of Greenland Falcons (*Falco candicans*) were recorded: the visitation of these birds lasted well into 1910. On 4th January a female was shot near Pitlochry (1.1910.119), and an adult male near Blairgowrie on the 23rd of that month (1.1910.119). On the Flannans one occurred on 25th January (1.1910.119), another was shot on Schiehallion early in the year (1.1910.119), and a Greenland Falcon was present on South Uist during most of January (1.1910.119). A male was shot at Rogart (Sutherland) on 8th March (1.1910.246), and a young female was trapped on Ardross Moor (Ross) next day (1.1910.246). Finally one was seen on the Flannans on 17th March. A Hobby (*Falco subbuteo*) is recorded near Innes (Elgin) in the end of June (1.1911.117). On 11th January a male Bittern (*Botaurus stellaris*) in good plumage was shot at Tarvit, Cupar (Fife) (1.1910.119); and a Glossy Ibis (*Plegadis falcinellus*) was procured in South Uist in November ("Field," 10th Dec.), this being the first record for the Outer Hebrides. A Flamingo (*Phænicopterus roseus*), probably an escaped bird, was seen at Cardross, on the Clyde estuary, on 9th and 23rd October; it had been noticed for some time before. It was finally reported as killed off Port-Glasgow (2.iii.35 and 71).

Bewick's Swan (*Cygnus bewicki*) was this year added to the fauna of Fair Isle (1.1911.53). Two Ruddy Sheldrake (*Casarca ferruginea*), one of each sex, were shot near Sarsclet (Caithness) on 27th June (2.ii.134), while King Eider (*Somateria spectabilis*) were seen at Fair Isle in spring (1.1911.53) and at Noss Sound, Bressay, on 29th June, one drake in each case.

A female of Baillon's Crake (*Crex bailloni*) was shot near Halkirk (Caithness) on 21st August, and in Bute a Dotterel (*Eudromias morinellus*) was seen on 15th May, the first note of this species in Bute (2.ii.142), while on 31st May one was procured on the Flannans, this being the second record for the Outer Hebrides. The Red-necked Phalarope (*Phalaropus hyperboreus*) is reported for the first time from Fair Isle (1.1911.53), and a Great Snipe (*Gallinago media*)

from the same station in spring. There are an unusual number of records of the Green Sandpiper (*Helodromas ochropus*) this year; it is recorded from Fair Isle on four days in spring and fourteen in autumn, one to three birds at a time. A Green Sandpiper was seen on 1st August beside the Medwin between Peeblesshire and Lanarkshire, and on the same day one is recorded near Largo (Fife). On 16th August a male was found with a broken wing close to a telephone wire on Dunipace property, and on the 18th a male was shot at Westerdale, near Halkirk. Spotted Redshanks (*Totanus fuscus*) were again seen at Waulkmill Glen Dam on seven occasions between the 26th June and 18th September, one to three each day (2.ii.142), and on 30th August a bird of this species was seen at Donmouth near Aberdeen (1.1910.249). There is only one previous record of this species in "Dec." On 30th March and 8th April a Black-tailed Godwit (*Limosa limosa*) in summer plumage was seen on the Cromarty Firth (1.1910.247), and on 7th June one is recorded as having been seen in Orkney, "very tame" (3.iv.221). There is no previous note of this species in Orkney. In Tiree, on 7th September, three very wild Black-tailed Godwits are recorded. Red-necked Grebes (*Podiceps griseigena*) are reported from Lerwick in autumn; one was seen on 21st October and four on the 26th—one of these had "summer plumage partly moulted only." Finally Sooty Shearwaters (*Puffinus griseus*) were seen on three occasions in the Firth of Forth—one not far off Elie on 8th September, one near Fidra next day (1.1911.114), and one off the Isle of May on 16th October (1.1911.6).

SUMMER AND NESTING.

As will be seen from the details given below nesting was earlier this year than in 1909; although the spring was very cold, it was extremely dry, and the birds seem to have reared their broods pretty successfully. Blackbirds are described as an increasing species in Orkney, nesting all over the mainland (3.iv.220); and in Clyde the Sedge Warbler has almost recovered its normal numbers after the scarcity of 1909 (2.iii.47). Swallows were nesting both at Bunscaith

and Balfour (Orkney), a few pairs in each case (3.iv.221): and the Hawfinch bred in Lauderdale (1.1911.53). Goldfinches are increasing in Clyde, a few nesting in one locality (2.iii.47). Crossbills showed a marked increase at Meikleour (Perthshire) in March and April (1.1910.181). Jays abounded on the island of Inchtavannoch, Loch Lomond; at least three pairs reared broods within a few hundred yards of the house-boats: none were seen in 1907, but by 1909 they had become comparatively common (2.iii.32). Pintail and Tufted Duck are increasing as breeding-species in Orkney (3.iv.221), while Capercaillie are reported to be becoming plentiful in Moray (1.1910.248). A new breeding colony of the black-headed Gull is reported from Renfrewshire (3.iv.223), and this species was nesting in numbers on the islands at Ollaberry (Shetland), and is said to be on the increase at Lerwick. The number of Kittiwakes breeding at Barrahead is increasing, while the Fulmar is also nesting more plentifully there and at Cape Wrath.

There was a marked scarcity of Willow Warblers about Largo (Fife), and of Redstarts, Tree Pipits, and Cuckoos at Loch Awe, while House Martins were unusually scarce in Mull, and Corn Buntings at Kirkliston. Great Spotted Woodpeckers nested in Dumfriesshire ("Birds of Dumfriesshire," p. 160), and birds of this species are recorded in several localities between mid-March and 20th August, *i.e.* Dunkeld, Gordonbush (Sutherland), near Glasgow, and at Cadder (2.ii.143).

A Dipper's nest at Kilduncan (E. Fife) was built in the cleft of a tree stump, 4 feet from the ground and over 150 feet from the nearest stream; the bird nested twice in the same place.

Turnstones remained throughout the summer in Largo Bay, the Cromarty Firth, North Ronaldshay, and Tiree; a flock of twenty or thirty was seen on the shore near Wick on 13th July.

The earliest note of nesting in 1910 appeared in the "Scotsman" for the 5th February, where it is recorded that Starlings were seen on 24th January, "feeding their young in the crack of a chimney top in the main street of Grantown-on-Spey." On 3rd February, Rooks were repairing their old

nests near Colinsburgh (Fife), and one pair had begun a new one. A Missel Thrush's nest was found at Thornhill (Dumfries) on 20th March, and on the 26th a pair of Long-tailed Tits were observed building their nest at Swordale (E. Ross), "both assisted and were working vigorously." From the "Scotsman" we take the note of a Dipper's nest by the Birkland Burn, Castle Douglas, with four hard-set eggs, "these eggs were hatched on the 31st, a very early date." Young Ravens were found in South Perthshire on the 27th March. On 8th April Mallard were hatching at Craignish (Argyll), and next day Stock-doves are reported as nesting, commonly in rabbit holes, at Luce Bay, and a Hoodie Crow's nest with three eggs was found at Craignish. On the 10th a Sparrowhawk's nest was found at Kirkliston, but the first egg was not laid till 5th May, and our correspondent notes that the young were fed by their parents till eight weeks old. From this time onward the nesting of our commoner species was general all over Scotland, the first dates of laying being rather earlier than last season. On the 21st a Grouse's nest with seven eggs was found at Forvie Sands near Aberdeen. Eider had eggs at Craignish on the 25th, and two days later a Little Grebe was laying at Kirkliston, exactly the same date as the first there last year. The persistency of a Song Thrush in nesting is recorded from Eoligaray, where the same pair of birds had four different nests, one after another (see 1.1911.55). From North Unst, under April, comes the note, "The Fulmar resides here and is now breeding."

On the 7th of May a Wigeon's nest with 8 eggs was found in Roxburghshire (1.1911.117), and a nest in Forth contained 9 eggs on the 13th (1.1910.249), and by the 19th young Eiders were hatched at Craignish (Argyll). From Kirkliston comes a note of very few Hedge Sparrows having laid before May. At least three pairs of Missel Thrushes were seen on the Mainland, Orkney, near Finstown this summer. There were two nests in mountain-ash trees, with four eggs in each on the 20th May (3.iv.220). This species is uncommon in Orkney, there being apparently only two records of its having nested there before, both being at Kirkwall ("Fauna of Orkney," p. 91). During the last week

of May about a dozen nests of Grey-lag Geese, all with young hatched, were found in Lewis. There were numerous nests of the Common Tern at Forvie, on 28th May, with 1-3 eggs.

From 30th May to 3rd June two pairs of Blackcaps were seen in Orkney, "and one pair on the island of Shapinsay undoubtedly had a nest." A pair of Whitethroats were also seen, and from their behaviour were believed to be nesting (3.iv.220). The Blackcap has been recorded before as breeding in Orkney. On 1st June two Golden Eaglets were taken from an eyrie near Loch Awe.

A pair of Tree-sparrows nested on the Isle of May, and on 2nd June many Arctic Terns were found breeding on Watersay, where Hoodies, Rock-doves, and Starlings were nesting in the cliffs. A Bullfinch at Eccles, Berwickshire, built its nest in the interior of a well, the only entrance being by the inlet provided for the handle, the bird seemed quite at home and had laid 6 eggs ("Scotsman").

On the Shiant Islands (Minch), on the 8th, several pairs of Fulmars flew up again and again to the ledges on the cliff, but it could not be ascertained if they were nesting. On the 14th a Gadwall's nest was found in Forth (1.1910.249). On the 18th a hen Snow-bunting had begun to build in Aberdeenshire; two days later the nest was finished and contained one egg, four more being laid later (1.1911.115). A newly-fledged young Hawfinch was found in a shrubbery near Haddington on the 28th, while a Hawfinch's nest was found in Lauderdale (1.1911.53).

A late nest of a Lapwing was found at Kirkliston on 3rd July; it contained 2 eggs, and the bird was sitting. On 5th and 6th July White Wagtails were seen on Fair Isle, evidently breeding there again ("Ibis," 1911.1), and in East Ross two parties of young Merganser of forty or fifty each were seen, "each party was in charge of one female only, who led, the young ones struggling after in a long line." A Willow Warbler's nest was found on the 16th, built among ivy on a wall 3 ft. 6 in. from the ground (1.1910.246), and on the 19th Arctic Terns, Greater and Lesser Black-backed Gulls, Herring Gulls, Kittiwakes, Shags, Guillemots, Razorbills, Puffins, Fulmars, and Storm Petrels are recorded as nesting on North Rona (1.1910.212-213).

On 3rd August Quails were heard calling near Stornoway (3.iv.156), and on the 6th a Nightjar's nest with 2 eggs was found on the slope of Torrmore near Tayvallich (Argyll) (1.1910.248). Two Corncrakes' nests with partially incubated eggs were found in a hayfield at Beattock on the 8th and 9th, and in the second week of August a Cuckoo was hatched out in a Corn Bunting's nest near the manse of Ollaberry (Shetland). A few days previous to 19th August a Greyhen was seen with two sets of chicks, one lot well grown, the other two or three days old (1.1910.247). A Stock-dove's nest with 2 eggs is reported from Kirkliston on 4th September, and a Twite's nest with 3 fresh eggs was seen at Inverfirth (Shetland) in the middle of September.

WINTER.

The climatic conditions in the early part of 1910 were such as to cause much distress among Redwings. Though these birds were scarce in the end of 1909, we have records of them in January 1910 in varying numbers from the Flannans, Butt of Lewis, Fair Isle, Pentland Skerries, Bass Rock, East Fife, and Craignish (Argyll). As these localities are all practically sea-girt, the birds congregated there when driven by severe weather from the interior of the country, or from the Continent. In East Fife they were "swarming on the 27th," and a good many very emaciated Redwings were found shortly after lying dead under the holly trees. Thrushes and Blackbirds, the latter mostly males, were noticed in Shetland, on the Pentland Skerries, Fair Isle, and the Flannans, and in great numbers in East Fife. Great Spotted Woodpeckers were noted early in the year in the Girvan Valley and at Glenorchard, Stirlingshire (2.ii.143). Greenland Falcons visited various parts of Scotland.

Eight Whooper Swans were noted in January flying over the moor at Corsemalzie (Wigtown), and there were a good many Swans in the Tay from time to time. A Gadwall was shot on the Loch of Stempster, while immense droves of Wigeon frequented the estuary of the Urr (W.H.A., "Scotsman") and the Tay, and this species is recorded several times from the Pentland Skerries. Among the Waders,

large numbers of Ringed Plover are reported from the Butt of Lewis, Lerwick, and North Ronaldshay, all in January. Large flocks of Golden Plover occurred on the Pentland Skerries, North Ronaldshay, and in Largo Bay; from this last locality Grey Plover are recorded several times. There was a great shortage of Woodcock at Gilston (E. Fife) in the winter of 1909-10, but this species and Snipe were "more plentiful along the sea-shore" in the estuary of the Urr than ever seen before by the recorder (W.H.A., "Scotsman"). Snipe were numerous on Fair Isle in the end of January. Iceland Gulls occurred on the Flannans and near the Isle of May.

The winter of 1909-10 differed entirely in character from that of 1910-11, the former being extremely cold, the latter very mild. Large numbers of Redwings and Fieldfares are noted in various places at the end of 1910, and we have many records of Blackbirds from the Fair Isle and Lerwick, this species being also numerous on Tiree in early winter. A few Grey Wagtails stayed throughout the winter in Mull, and several Waxwings are reported in November and December. Siskins were rather common in the Lothians early in winter. A good many Mealy Redpolls lingered after the great immigration, and are noted in many places. Northern Bullfinches too are recorded right into winter. Great Spotted Woodpeckers were seen in Dumfriesshire (1.1911.116), and early in November two Hen-Harriers were seen hunting the moors in the West Linton district (Peeblesshire), and on the 17th an adult female was shot on the White Moss, Medwyn (1.1911.55). On 24th December a young male of this species was procured at Scarfskerry, Caithness. A Rough-legged Buzzard was noticed at Drumblair Moor, Luce Bay, in mid-November, and about this time one was shot in Fife.

Whooper and Bewick's Swans are noted in hundreds in Tiree in December, the latter predominating; Whoopers are also recorded from Mull, and on 25th November 19 arrived at the White Loch of Myrton (Wigtown), and 4 more had joined them before next morning. All left about 9 A.M. on the 26th (1.1911.113).

Immense flocks of Wood-Pigeons are recorded as passing the Bass on 27th November, and they frequented East Fife

in great numbers about this time ; while large flocks of Rock-doves are noted at Barra Head.

A great many Sclavonian Grebes and Great Northern Divers are recorded from Barra in November, and quite a lot of Little Auks occurred in various parts of Scotland.

FOOD, ETC.

In East Ross in July flocks of Greenfinches were feeding on the sea-pink seeds by the shore. The large flocks of Mealy Redpolls paid toll to the birds of prey ; at Ollaberry (Shetland), on 30th October, a small Hawk [probably a Merlin] "dropped on the rearguard of a flock of Mealy Redpoles" and secured a victim, when only about 10 yards from the observer. In East Fife on 21st March, a female Kestrel was seen trying to fly off with a young Leveret, which, however, she dropped, after carrying it a few yards. It was still quite warm, but the head was wanting. On the 26th of the month a Kestrel was seen by the Glasgow Natural History Society, to catch a bat (*Vesperugo pipistrellus*) on the wing, seizing it in its talons (2.ii.137) ; while on 8th July, in East Ross, one of these birds was seen attempting to eat a snake [? slow-worm]. A Mallard Drake is recorded as having been found on Ailsa Craig choked by an eel in its throat ("Scotsman"), while a Heron met the same fate when endeavouring to devour a Water-rat, 9 inches long ("Scotsman"). Black-headed Gulls are noted on Loch Awe, on 11th March, eating the small grey fly, while one of these birds was drowned in the Tay near Perth, by a Mallard Duck, who, resenting its presence too near her brood, seized the Gull by the back of the neck and shook it as a terrier does a rat. Then, still holding the Gull's neck in her bill, she forced the unfortunate bird under water and swam backwards and forwards with short rapid rushes till the Gull was drowned ("Scotsman"). A Herring Gull in immature plumage, on the shore at Dalmeny, seized a Dunlin which had incautiously come within reach of it, tore its victim to pieces, and swallowed it ("Scotsman"). In North Unst the Arctic Skuas often persecute the Puffins, which are there in myriads. "To escape their pursuer the Puffins sometimes fly so high that

they can just be seen as a mere speck. When the Skua observes a good catch, he makes straight for the Puffin at a terrific rate. The Puffin never seems to see the Skua till he is upon him, then makes a headlong flight for the water, dropping like a stone from the heavens, the Skua just a pace or two behind. When about to strike the water he takes a shear along the surface, and as he enters the water he drops his catch and dives immediately. I have never seen a single instance of the Puffin showing fight." Our excellent correspondent writes further : " This summer I have repeatedly seen the Great Skua swoop down on a Puffin or Kittiwake on the water, seize it and hold it under till drowned ; then pluck and eat it in the manner of the Falcon." A curious accident to a young Tern is recorded from the Butt of Lewis ; this bird was found in a dying condition on 15th August with a quill feather, 6 inches long, fixed in its throat.

PLUMAGE, VARIETIES, ETC.

Several albinistic varieties have been recorded during the year. Two pied Blackbirds are reported, one in Edinburgh, the other in East Fife ; the latter was a curious variety, being white and black all over in alternate small patches, looking almost like a shepherd's plaid. On 15th July an almost perfect albino Wheatear was procured in Unst (1.1910.246) and a bird of this species was seen near Largo (E. Fife) on 1st August, with the whole of its head and back white, right down to the rump. A pure white Wood Warbler was obtained near Drumlanrig, Thornhill, in the end of July (1.1911.55), and an albino Chaffinch was seen near Largo on 10th and 11th February, 17th June, 3rd July, and 1st December. A cream-coloured Sparrow is recorded at Ballantrae (E. Ross) on 14th July, and a white one in the same county on 4th November. On 8th August a Rook with white secondaries in both wings is reported from Tarbatness. It seems wiser to reserve judgment on the abnormally coloured Gannet recorded from the Bass on 14th and 31st July and 1st August (3.iv.152) pending the results of this year's observations, as to whether it was a painted bird or not. An Eider Duck, of a uniform pale whity fawn, was seen near the Isle of

May on 3rd September. Three pied male Black Grouse were shot on the Loch Inch Moors in the autumn of 1910, while a white Grouse, a female, was shot at Bamff, near Alyth, on 13th August (1.1911.56). The only other albinistic variety recorded is a white Ringed Plover, obtained near Kirkwall (Orkney) on 20th August ("Field," September 17, 1910).

On 20th September an adult male Black Grouse was shot at Glen Trool (Wigtown), which had partly assumed female plumage. The generative organs appeared to be perfectly healthy and similar to those of a normal male ("Field," March 11, 1911). A few notes on the assumption of summer plumage have been sent. On 29th January Black-headed Gulls at Kirkcaldy were assuming their black hoods, while by 11th February two were seen at Saltoun in full summer dress. By 26th February Cormorants were seen in nuptial plumage, and next day a Guillemot in full summer plumage was found lying dead in Largo Bay. On the other hand, on 13th May in Loch Linnhe, and on 9th June in the Sound of Sleat, where many Guillemots and Razorbills were seen, "quite a number" were still in winter plumage; and on 16th June a Common Tern, in winter plumage with a white forehead, was swooping at intruders on an East Fife ternery.

(To be continued.)

THE AQUATIC COLEOPTERA OF THE NORTH EBUDES.

By FRANK BALFOUR-BROWNE, M.A. (OXON), F.R.S.E., F.Z.S.

THE group of islands including Skye, Rhum or Rum, Canna, Eigg, and Muck were named the North Ebudes, by the late H. C. Watson, in the "Cybele Britannica." So far, very few Coleopterists seem to have visited any of these islands, and the records of Water-beetles apparently include only six species of Hydradeephaga and none of Gyrinidæ or Hydrophilidæ, one of the records being for Rhum and the other five for Skye.

As the fauna and flora of these western islands are of extreme interest in connection with the question of the origin of the Britannic¹ fauna and flora, I took the opportunity of spending a week in the district during last September, staying a few days at Broadford in Skye, and a few days on the island of Eigg.

Neither of these islands presents much variety of habitat, peat-moss and stream being practically the only kinds of collecting ground. In Skye, I spent my time on the ground immediately around Broadford, chiefly on the peat-mosses between Ben Suardal and the road from Broadford to Loch-na-Dal and Isle of Ornsay. My chief object was to discover as much as possible of the 'Arctic' group of water-beetles of which *Deronectes griseo-striatus*, *Dytiscus lapponicus*, *Hydroporus morio*, *tristis*, and *melanarius*, *Agabus arcticus* and *congener*, and *Ilybius aenescens* are examples. Several of these species have an extensive range in the British Islands, but the first two are limited to highland lochs in Scotland and Ireland,² and, so far as is at present known, they show a decidedly discontinuous distribution. I was therefore specially anxious to know what their associates were, and kind of habitat they survive in.

Those who have taken *D. lapponicus* in the British Islands have favoured us with fairly minute descriptions of habitat and other details. I have less than a dozen references to the capture of this species, but in every case where sex is mentioned the scarcity of the female is remarked upon. Somerville (1867) mentions that he took 45 specimens in Mull, and "with very few exceptions all were males." Buchanan White (1870) remarks on the scarcity of females in Mull and in Strathglass (East Inverness); in this latter locality out of 12 or 14 specimens only 3 were females. J. J. King (1897) also remarks that in Mull he found the females much scarcer than the males.

In every case where details of the habitat are mentioned, the absence of fish and the presence of newts is remarked

¹ The term "Britannic" includes all the British Islands. *Vide* G. H. Carpenter and W. Evans, "Proc. Roy. Phys. Soc. Edin." xv. 219 (1904); or G. H. Carpenter, "Irish Nat." xv. 13 (1906).

² For *Deronectes griseo-striatus* in Ireland, *vide*. "Irish Naturalist," Sept. 1910, p. 183.

upon, the absence of fish being associated with the fact that no stream flowed out of the loch.

The habitat in Mull¹ is a deep lochan with bottom of loose stones, broken pieces of lava, and almost no vegetation, the edges rapidly falling away into deep water. Buchanan White compares the Mull and Strathglass habitats, the latter being a loch on Ben Chearan [Beinn Acharain?], as follows:—"In both localities the lochs in which the beetle is found are somewhat similar in character. In both cases they are near the tops of hills, in one case about 2000 ft., and in the other 600 to 700² ft. above sea-level. In both, the bottom is stony with little or no vegetation, and into or out of neither of them flows any conspicuous stream. Consequently, perhaps, no fish inhabit them. In the Strathglass loch the *Dytiscus* occurred to me only in one corner where, upon the only muddy part of the loch, rested some large stones. On and under these stones the beetles rested, betaking themselves to deeper water when disturbed, and as they seemed very easily alarmed, repeated visits to the loch resulted in only about a dozen captures." He also mentions that in Mull he found the easiest way to take the beetles was to turn over the stones gently, and lift the beetles with the fingers as they swam slowly away.

In my experience, gained in Norway, Skye, and Eigg, I found that where *D. lapponicus* occurred there were no out-flowing streams, and fish were apparently absent. In all cases the habitats were mere lochans.

I first took the species some years ago in Norway near Fefor (Gudbrandsdal) at about 3000 ft. elevation in a small deep peaty loch. In one corner of this loch was a mass of vegetation (sphagnum, etc.), and here I took three specimens, 2 ♂ and 1 ♀, and a large number of nearly full-grown larvæ. The time of year was July. The whole bottom of the loch was peat with an occasional large stone or two, but the water was too deep, even at the edge, to examine these or turn them over. With the *Dytiscus* were such British species as *Hydroporus umbrosus*, *palustris*, and *erythrocephalus*,

¹ The "crater" loch above Tobermory is the habitat to which, I believe, most authors refer. Alex. Somerville, however, took the species in the south of the island.

² The "crater" loch in Mull is about 775 ft. above sea-level.

Agabus arcticus and *bipustulatus*, *Ilybius subæneus* (common), *Rhantus bistriatus* and *Acilius sulcatus* (common). I have no record of newts, though possibly they occurred.

Above Broadford in Skye I found, at 800 ft. elevation, a lochan, one corner of which reminded me very much of the Norway loch; this corner was peaty, though not more than perhaps 3 to 4 ft. deep, and was thick with water-plants—*Castalia speciosa*, *Myriophyllum*, *Potamogeton lucens?*, *Sparganium natans* or *minimum*, etc.—and in this corner I took one or two females of *D. lapponicus*. The other end of the loch and all along one side was stony, and the day being sunny and calm I saw several other specimens and took altogether 5 females and no males. One of the specimens was very soft, having evidently only recently emerged from the pupa. The lochan literally swarmed with Gammarus, and young newts were numerous; there were also a number of tadpoles and one toad came up in the net.

Associated with the *Dytiscus* were the following species:—

<i>Haliplus fulvus</i> (two or three).	<i>Rhantus exoletus</i> (abundant).
<i>Deronectes griseo-striatus</i> (fairly common).	<i>Acilius sulcatus</i> , var. <i>scoticus</i> (common).
<i>Hydroporus erythrocephalus</i> (common).	<i>Gyrinus minutus</i> .
<i>Agabus arcticus</i> (very common).	<i>G. natator</i> .

Many of the *A. arcticus* and most of the *Rh. exoletus* were soft, and many specimens of these two species were sitting out of the water upon projecting stones. The temperature of the water at 3 P.M. was 15.5° C. (about 60° F.).

The form of the *Rh. exoletus* was such that, at the time, I was uncertain whether the specimens really belonged to that species. The specimens are smaller, narrower, and more parallel-sided than the typical form, and quite recently Mr. Anderson-Fergusson sent me a specimen taken by him at Fauldhouse (West Lothian), "750-1000 ft.," which in all respects agrees with my Skye specimens. The form is not, however, entirely confined to mountains, as I have a similar specimen, except that it is much larger, from East Norfolk; also it is not the only form found on mountains, as I have specimens from a highland loch in Antrim in which *Deronectes*

griseo-striatus is common, which are of the typical form of the species.

This lochan was the only one which I visited in Skye in which the *Dytiscus* occurred, and it was the only one I found which satisfied the conditions of having no visible outflow and a reasonable depth. Quite close to it is another small loch named on the ordnance map "Loch-an-Starsaich." This loch is stony and comparatively shallow for some distance from the edges, and has a stream running from it down to Loch Eilort. Its fauna was as follows:—

<i>Deronectes assimilis</i> .	<i>Dytiscus punctulatus</i> (1 ♂).
<i>Hydroporus palustris</i> .	<i>Acilius sulcatus</i> .
<i>H. erythrocephalus</i> .	<i>Gyrinus natator</i> .
<i>Agabus arcticus</i> .	<i>G. opacus</i> .
<i>Rhantus exoletus</i> .	

I am inclined to think, although I am speaking on somewhat meagre experience, that *D. assimilis* and *griseo-striatus* are what might be called "complementary" species, the former occurring in lochs not highland enough for the latter and the one tending to replace the other. The same relationship exists, I think, in the case of *Hydroporus morio* and *gyllenhalii*, the former being found in peaty pools up to a certain level, above which the latter replaces it. Of course no sharp line can be drawn in either case, and the species overlap, but this does not invalidate the statement.

In Eigg I found *D. lapponicus* in two different parts of the island, and I feel certain that it occurs in one or two lochans other than those in which I found it.

Near Beinn Tighe is a series of three deep peaty lochans about 850 feet above the sea. Along the sides are patches of *Sphagnum*, *Scirpus fluitans*, and other water plants, and in one or two places are more extensive swampy *Sphagnum* patches which at some previous period have been open water. In the water are patches of *Menyanthes*, of *Lobelia Dortmanna*, and *Sparganium minimum*? or *natans*? and on the bottom in the deep water *Isoetes* is to be seen. The three lochans differ slightly from one another in their level, in their flora, and in the extent of open water. Their depth, especially in the case of two of them, and the

steepness of the sides in places made collecting difficult, and except in the swampy Sphagnum areas I could only collect by scraping the net along the edges where Sphagnum, Scirpus, and other plants gave some possibility of shelter. The Beetle fauna of the three lochans is the same, except that I did not find *D. lapponicus* in the third—and two elements are clearly distinguishable in the following list, the loch fauna and a fauna characteristic of pools on peat mosses. The latter species came from the Sphagnum swamps without exception. Newts abounded in all three lochans. The fauna was as follows :—

Deronectes assimilis (1).	Rhantus bistriatus (a few in swamp).
D. griseo-striatus (common).	
Hydroporus tristis (common in swamp).	Dytiscus punctulatus (1 ♂ and 2 ♀ in two lochs).
H. gyllenhalii (common in swamp).	D. lapponicus (1 ♂ and 1 ♀ in lochs).
H. erythrocephalus (loch and swamp).	Acilius sulcatus (common in loch).
H. obscurus (swamp).	Gyrinus natator.
H. pubescens (swamp).	Philhydrus melanocephalus (in swamp).
Agabus arcticus (very common, loch and swamp).	Anacæna globulus (in swamp).
A. bipustulatus (common in swamp).	Limnebius truncatellus (in swamp).
Ilybius ænescens (1 in swamp).	Helophorus viridicollis (in swamp).

On the last day of my stay on Eigg I visited the Lochan-na-Beinn Buidhe, a small shallow loch in the north end of the island, 950 feet above sea-level. The bottom is quite hard and covered with a fine gravelly silt, and all over the loch Eleocharis, the club rush, was growing sparsely with occasional patches of Juncus. On the west side a low bank overhangs the water, while on the east side there are a number of large loose stones in the shallow water. I should imagine that nowhere does the loch exceed 3 feet in depth, if it even reaches that.

I first collected by wading in the water and working the net under the overhanging bank on the west side, and by this means I found all the species in the list. *D. lapponicus* was represented by 5 or 6 specimens on that side, but when I worked along the other side, gently lifting the loose stones,

one or more specimens appeared under most of them. The specimens were easily captured in the fingers, and as they were common I noted the proportion of the sexes, and in twenty minutes I had counted 21 females and 12 males.

In the loch *Gammarus* was common, but I only saw one or two newts, and it certainly did not look a suitable place for them. A large proportion of the *D. lapponicus* were soft and recently emerged specimens.

The list of species is as follows :—

<i>Deronectes griseo-striatus</i>	<i>Dytiscus lapponicus</i> (common).
(common).	<i>Gyrinus natator</i> .
<i>Hydroporus obscurus</i> (1).	<i>Anacæna globulus</i> (2).
<i>Agabus arcticus</i> (common).	<i>Limnebius truncatellus</i> (1 or 2).
<i>A. sturmii</i> (2).	

The *H. obscurus*, *A. globulus*, and *L. truncatellus* occurred at a spot where a trickle of water fell over the western bank into the loch from a patch of boggy ground.

My experience with regard to *Dytiscus lapponicus* therefore differs in one respect from that of other British collectors, since I found in two cases the females were more common than the males. The habitat of the species also varied to some extent, and the Lochan-na-Beinn Buidhe was, from my previous experience, a most unlikely place to find the species. One or two other lochans on the western side of the island, in which *D. griseo-striatus* and *A. arcticus* were common, would possibly have yielded *D. lapponicus* if I had carefully turned over the stones.

For this kind of collecting, calm weather is essential, as a ripple on the water makes it impossible to see the Beetles when a stone is turned over, but, although King stated that sunshine was essential, I took the species on Ben Buidhe while the mist was down on the higher ground just above the loch. In the last-named place I found one full-grown larva of the species, and that was the only specimen I saw.

The proportion in the numbers of the sexes is a point of some considerable interest. Of those who refer to the dominance of the male, Buchanan White mentions, in referring to his visit to Mull in the beginning of September, that numbers of full-grown larvæ were about. Somerville

mentions that he took the species in Donegal in August, and King visited Mull in July.

Although my experience was gained at the same period of the year as that at which Buchanan White spoke of Mull, I found only one larva and numbers of newly emerged imagines, a fact which suggests that the season was perhaps earlier in 1910 than in 1870; but it also suggests a possible explanation of the difference in the proportionate numbers of the sexes. It suggests that the female is short-lived, perhaps dying after oviposition, while the male survives more than a season, and this seems to be the only possible way of accounting for the difference in my observation from that of others, unless the phenomenon was abnormal. It was only because I collected the newly emerged specimens that I found females more numerous than the males. Had this possibility occurred to me when at Loch Buidhe, I would have noted the number of immature specimens among males and females, but now the problem must remain obscure until some one once more hits upon the psychological moment when the new individuals are appearing!

Having discussed at some length the habits and habitat of *D. lapponicus* I will only mention a few other species which seem worthy of special note. The Broadford River yielded two interesting species; *Deronectes latus* occurred in it, as did also a single specimen of *Platambus maculatus*. With regard to the former species, with the exception of a record for "Moray" (Sharp, "Coleoptera of Scotland," 1871-8) this is the most northern record in the British Islands. The species is a southern one, as is also the genus, which is chiefly Mediterranean, although a few species, such as our *D. griseo-striatus*, reach the Arctic regions and extend into North America. Of British records, there are only three other Scottish ones — Clackmannan (Andrew Murray), Stirling (Power), and Berwick (Andrew Murray and T. J. Bold). It has been recorded for most of the northern counties of England, but for none of the Midland counties, but in the south there are records for Glamorgan; N. Wilts; Berks; Sussex E.; Hants S.; Dorset; and Devon N. and S.

With regard to *P. maculatus* the specimen was not the

dark unspotted variety often found in highland streams, but one with a fair amount of yellow marking such as is common in lowland streams in the south of Scotland.

Although *Hydroporus rivalis* was common in the Broadford River, *H. septentrionalis* was not to be found, and the peculiar vagaries of these two species as to their distribution is a mystery.¹ At present I have no record in Scotland for the latter species north of Dumbarton, Perth S., and Clackmannan and Fife—except Aberdeen S., Easterness, Elgin, and Ebudes Mid. It is recorded for almost all the southern Scottish counties, and probably occurs in all the northern English ones, though the records are only for Cumberland, Northumberland S., Durham, Yorks N.E. and Mid W., and Lancs Mid and S., and the only other English records are for Chester, Salop, Hereford and Devon S., with an outlying one in Leicester. In Ireland the records are at present all for coastal counties, its distribution being what Praeger has termed marginal.² There is therefore either a great deal to be discovered or a great deal to be accounted for in its distribution.

Agabus congener had been previously recorded for Skye (W. A. Forbes), but in my experience it was rare, as I only took two or three specimens in a Sphagnum pool on the lower slopes of Beinn na Caillich, where a single specimen of *Ilybius ænescens*, the only one I saw in Skye, also occurred. A few specimens of *Paracymus nigroæneus* turned up on Eigg, but the species was evidently scarcer than in the Mid Ebudes.³ *Octhebius lejolisii* also, although difficult enough to find at Oban,³ and on Coll,³ was infinitely more so on Eigg, where, after an hour's search, I found one imago and one larva, and another half-hour failed to discover any more. While waiting for the steamer at Mallaig (Inverness W.) I spent half an hour on the rocks just to seaward of the fish-curing buildings and found a single specimen there also. I did not attempt to find the species in Skye, though it is probably to be found there.

(To be continued.)

¹ Vide also 'The Aquatic Coleoptera of the Isle of Man' on this point, "The Naturalist," 1911.

² 'On Types of Distribution in the Irish Flora,' R. H. Praeger, "Proc. Roy. Irish Acad." xxiv. Sect. B. 1902.

³ 'The Aquatic Coleoptera of the Mid Ebudes,' "Ann. Scott. Nat. Hist.," April 1910, p. 79.

CONTRIBUTION TO OUR KNOWLEDGE OF THE HYDROID FAUNA OF THE WEST OF SCOT- LAND.

BEING AN ACCOUNT OF COLLECTIONS MADE
BY SIR JOHN MURRAY, K.C.B., ON S.Y. "MEDUSA."

By JAMES RITCHIE, M.A., B.Sc.,
The Royal Scottish Museum.

(Continued from p. 34, No. 77, January 1911.)

Family CAMPANULINIDÆ.

38. *STEGOPOMA FASTIGIATUM* (Alder) (= *Calycella fastigiata*
of Hincks's "History").

MULL OF CANTYRE, 49 fms.
FIRTH OF LORNE, 20-30 fms.

39. *CALYCELLA SYRINGA* (Linn.).

As Broch¹ has recently shown, an extraordinary amount of variation takes place in this species, especially as regards the relative proportions of peduncle and hydrotheca. As a rule, however, according to Broch, the length of the former lies between a half and the full length of the hydrotheca. The specimens obtained by Sir John Murray, on examples of *Aglaophenia tubulifera* from Loch Lorne, 30-110 fms., are exceptional in several respects. The hydrothecæ are themselves longer than is normal; but, notwithstanding, the length of their peduncles is far out of proportion, for they may be twice as long as the hydrotheca. The hydrothecæ, too, are characterised by the presence of many successive margins due to the death and subsequent regeneration of the hydranths, as many as seven being counted in one case. I am of opinion, in view of Broch's researches, that these unusual proportions could well fall within the limits of variability of *Calycella syringa*, although Hartlaub² has created a species, *C. gracilis*, for specimens with similar habit. The following measurements of the Loch Lorne and typical forms give a more accurate idea of the relative sizes:—

¹ Hj. Broch, 'Die Hydroiden der arktischen Meere,' in "Fauna Arctica," Band v. Lief. 1, 1909, p. 164, Fig. 22.

² Cl. Hartlaub, 'Die Hydromedusen Heligolands,' "Wiss. Meeresunters. deutsch. Meere," 1897, p. 451.

	Typical specimens. ¹	Specimens from Loch Lorne, 30-110 fms.
Stem, length	0.15 mm.	up to 0.70 mm.
Stem, diameter	0.051-0.063 mm.	0.054 mm.
Hydrotheca, length of primary hydrotheca	0.31 mm.	0.33-0.49 mm.
Hydrotheca, total length including additional margins	0.42 mm.	0.56-0.66 mm.
Hydrotheca, diameter	0.111-0.13 mm.	0.10-0.13 mm.
Gonangium stalk, length	?	0.17 mm.
Gonangium, length of body	?	0.28-0.38 mm.
Gonangium, greatest diameter	?	0.17 mm.

CLYDE SEA AREA.—KYLES OF BUTE—off Tighnabruaich, on *Thuiaria tenera*.—BARRIER PLATEAU—Sound of Sanda, 22 fms., on *Campanularia verticillata*; between Sanda Is. and Ailsa Craig, 24 fms., on *Thuiaria lonchitis*, *Diphasia attenuata*, and *Hydrallmania falcata*.

MULL OF CANTYRE, 50 fms., on *Halcium muricatum*; 64 fms., on *Antennularia ramosa* and *Abietinaria filicula*.

SOUND OF JURA, 17-25 fms., on *Campanularia verticillata*.

SOUND OF MULL, 68 fms., off Duart Castle; 70 fms., on *Abietinaria abietina*.

FIRTH OF LORNE, 10-30 fms., c. on *Diphasia pinaster*; 30-110 fms., on *Aglaophenia tubulifera*; 70-80 fms., on *Diphasia pinaster* and *Thuiaria cupressina*; 60-70 fms., on *Eudendrium capillare* and *Diphasia alata*.

40. OPERCULARELLA LACERTA (Johnston).

CLYDE SEA AREA.—BARRIER PLATEAU—Sound of Sanda, 22 fms., on *Campanularia verticillata*.

LOCH ETIVE, 70 fms., r. on *Hydrallmania falcata*.

41. CAMPANULINA REPENS, Allman.

FIRTH OF LORNE, 60-70 fms. (M.).

42. CUSPIDELLA GRANDIS, Hincks.

FIRTH OF LORNE, 30-110 fms., on *Aglaophenia tubulifera*.

43. CUSPIDELLA HUMILIS, Hincks.

FIRTH OF LORNE, 30-110 fms., on *Aglaophenia tubulifera*; 50-70 fms., a solitary hydrotheca on *Bougainvillia ramosa* (?).

¹ From north of Cape Wrath, 125 metres.

Family SERTULARIDÆ.

PARASCYPHUS, *gen. nov.*

As I have found it necessary to found a new genus for the following species, I give here a short diagnosis of the genus.

Trophosome.—*Trophosome* Campanularian in aspect, consisting of a hydrocaulus, divided into a series of internodes, each bearing a hydrotheca. Hydrothecæ subcylindrical, pedunculate, having an emarginate rim furnished with an operculum consisting of a few definite valves; the cavity of the hydrotheca separated from that of the peduncle by an imperfect diaphragm. Hydranth bilaterally symmetrical, of Sertularian type, with blind-sac, retractor and protractor muscles, and a wide hypostome surrounded by a whorl of filiform tentacles.

Gonosome.—Unknown.

The discovery of the Sertularian nature of the hydranth places this genus in the family Sertularidæ.

The following is the only species known :—

44. PARASCYPHUS SIMPLEX (Lamouroux).

Laomedæa simplex, Lamouroux, "Hist. polyp. corral. Zoophytes," 1816, p. 206.

Campanularia tridentata, Bale, "Proc. Roy. Soc. Victoria" (n.s.), vol. vi., 1894, p. 98, pl. iii. fig. 3.

Sertularella tridentata, Hartlaub, "Abh. Ver. Hamburg," vol. xvi., 1900, p. 46, fig. 21.

Thyrosocyphus tridentatus, Hartlaub, "Zool. Jahrb. Syst." vol. xiv., 1901, p. 369, pl. xxi. fig. 14, pl. xxii. fig. 23. *Idem*, Ritchie, "Trans. Roy. Soc. Edinburgh," vol. xlvii., 1909, p. 75, fig. 1, *a*, *b*.

Thyrosocyphus simplex, Billard, "C. R. Acad. des Sc." vol. cxlviii., 1907, p. 1065. *Idem*, Billard, "Ann. Sc. Nat. Zool." (n.s.), vol. ix., 1909, p. 312.

The following short description of the specimen before me will serve to indicate the characters of this species, which has not hitherto been recorded from the North Atlantic :—

Trophosome.—The two stems are short (the longest 8 mm. high) and unbranched, springing from a stolon which itself appears to be the continuation of a stem. The stem is divided into regular internodes, between which are slanting nodes, often, however, very indistinct. On each internode is borne a hydrotheca which alternates with its predecessor and successor, and lies in the same plane with them. A hydrotheca rests upon a short process at the distal end of an internode, and is marked off from this process by a distinct boundary line. Occasionally one or more joints appear to be inserted between the hydrotheca and the stem-process; but these, as I have already shown (1909, p. 75, fig. 1, *b*), are not normal but

accidental, due to the destruction and subsequent regeneration of the hydrotheca. The stem itself shows evidence of truncation and regeneration. Near the base of the adcauline wall of the hydrotheca and on its inner surface is a knob of chitin representing, in optical section, the diaphragm which separates the hydrotheca-cavity from that of the stem, and which is bilaterally symmetrical, being well developed on the adcauline wall and gradually diminishing as it traverses the sides of the hydrotheca until on the abcauline wall it has disappeared.

The hydrothecæ are subcylindrical, much deeper than broad, and bilaterally symmetrical along the plane in which stem and hydrothecæ lie. They have an almost straight abcauline and a strongly convex adcauline profile, and the

margin is divided into three deep bays separated by three large, equal, pointed teeth, of which one is adcauline and the other two latero-abcauline. There is a three-valved operculum.

The hydranth is of Sertularian type, with dome-shaped hypostome, a large blind-sac, and with a protractor muscle attached to the abcauline wall close to the margin, and a retractor muscle attached to a slight projection in the adcauline wall, a short distance above the diaphragm. It has 14-16 tentacles.

The gonosome is unknown.

Dimensions :—

Colony, height	8 mm.
Stolon, diameter	0.24-0.25 mm.
Hydrocaulus, diameter	0.15-0.18 "
Distance between hydrothecæ	0.45-0.82 "
Hydrotheca, length	0.45-0.56 "
" maximum breadth	0.18-0.19 "

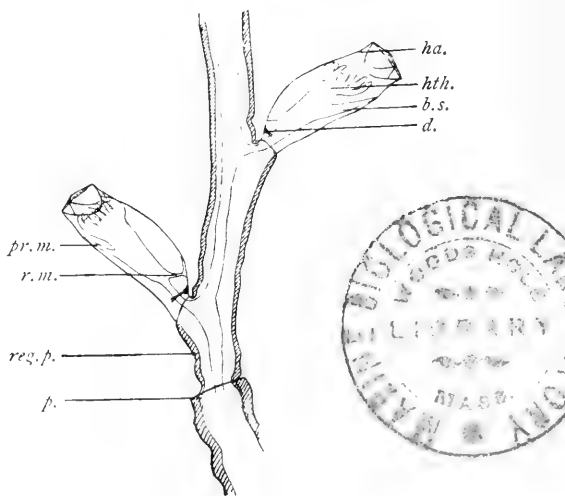


Fig. 1. *PARASCYPHUS SIMPLEX*. $\times 40$.

Fragment of stem with hydrothecæ of *Parascyphus simplex*, from between Sanda Is. and Ailsa Craig. *b.s.*, blind-sac of hydranth; *d.*, diaphragm; *ha.*, hydrotheca; *hth.*, hydranth; *p.*, perisarc of old stem; *pr.m.*, protractor muscle of hydranth; *r.m.*, retractor muscle of hydranth; *reg.p.*, thin regenerated perisarc of new stem.

Those measurements show that the Scottish specimen differs from the type specimen, measurements of which are given by Billard (1909), and from the Gough Island specimen, which I have described, in having hydrothecæ smaller in all dimensions than theirs.

Locality.—CLYDE SEA AREA—BARRIER PLATEAU—between Sanda Is. and Ailsa Craig, 24 fms.

The valuable investigations of Dr. A. Billard have shown that the species described by Bale as *Campanularia tridentata* is identical with *Laomedea simplex* of Lamouroux, the locality of which is indeterminable. The only records of which I am aware are: Port Phillip in the south of Australia (Bale, 1894); French Pass, north of South Island, New Zealand (Hartlaub, 1901); Gough Island, midway between Cape of Good Hope and Cape Horn (recorded by me in 1907 from the collections made by the Scottish Antarctic Expedition), and the present record, which adds the species to the fauna of the North Atlantic.

45. DIPHASIA ALATA, Hincks.

FIRTH OF LORNE, 20 fms.; 60-70 fms., many colonies growing on two bivalve shells.

46. DIPHASIA ATTENUATA, Hincks.

CLYDE SEA AREA.—DUNOON BASIN—E. side, 8-42 fms., r. (M.).
ARRAN BASIN—Kilbrennan Sound, Otterard to Carradale,
18-20 fms., r. (M.). BARRIER PLATEAU—between Sanda Is.
and Ailsa Craig, 24 fms.

MULL OF CANTYRE.

FIRTH OF LORNE, 70-80 fms. (M.).

BETWEEN CANNA AND RUM, on *Diphasia pinaster*.

47. DIPHASIA FALLAX (Johnston).

CLYDE SEA AREA.—ARRAN BASIN—centre, off Saddell, 47 fms., r. (M.).

FIRTH OF LORNE, 50 fms. (M.); 60-70 fms., on *Diphasia pinaster*.

48. DIPHASIA PINASTER (Ell. and Sol.).

CLYDE SEA AREA.—ARRAN BASIN—Kilbrennan Sound (M.).

FIRTH OF LORNE, six records at depths from 10-110 fms.; at one locality, specimens were growing on the back of a masked crab.

BETWEEN CANNA AND RUM, 60-110 fms. (M.).

49. DIPHASIA ROSACEA (Linn.).

CLYDE SEA AREA (M.).—DUNOON BASIN—20-40 fms.; E. side, 8-30 fms. ARRAN BASIN—Kilbrennan Sound.
BETWEEN CANNA AND RUM, 60-100 fms. (M.).

ABIETINARIA, Kirchenpauer.

The genus *Abietinaria* includes a group of species distinguished from those belonging to *Sertularia*, *Sertularella*, and *Thuiaria*, by the fact that the operculum is attached to that wall of the hydrotheca which is nearest the internode (adcauline), and is single-valved; and from *Diphasia*, because the hydrothecæ are not strictly opposite, are flask-shaped, and taper to a small aperture.

50. ABIETINARIA ABIETINA (Linn.) (= *Sertularia abietina* of Hincks's "History").

CLYDE SEA AREA (M.).—GARELOCH, 20 fms.; DUNOON BASIN—E. side, 8-20 fms.; centre, 20 fms., r.r.; W. side, 6-8 fms., r. UPPER LOCH FYNE—Minard Narrows, 12-20 fms., r. ARRAN BASIN—Kilbrennan Sound, in line with Davarr Is. and Brown Hd., Arran, 27-30 fms.; Otterard to Carradale, 15-20 fms., r.; off Saddell, 47 fms., r.; off Pladda, 30-35 fms., r. BARRIER PLATEAU—Sanda to Achinloan, 19 fms., r.; between Sanda Is. and Ailsa Craig, abundant and fine.

FIRTH OF LORNE, 30-35 fms., c.; 60-70 fms.

SOUND OF MULL, 70 fms.

LOCH CARRON, 60 fms. (K.).

51. ABIETINARIA FILICULA (Ell. and Sol.) (= *Sertularia filicula* of Hincks's "History").

CLYDE SEA AREA (M.).—GARELOCH—head to Stroul; across Narrows, 5-21 fms. LOCH GOIL—across Barrier, 9-20 fms. UPPER LOCH FYNE—Minard Narrows, 11-25 fms., r.

MULL OF CANTYRE, 64 fms.

FIRTH OF LORNE, 30-50 fms. (M.). LOCH ETIVE, 70 fms.

52. THUIARIA ARGENTEA (Linn.) (= *Sertularia argentea* of Hincks's "History").

CLYDE SEA AREA.—GARELOCH (M.).—head to Stroul, m.c.; across Narrows, 3-14 fms., c., plentiful at Narrows; E. side, 5-9 fms., r. DUNOON BASIN (M.).—E. side, 5-16 fms., r.; centre, 10-20 fms., m.c.; W. side, 6-8 fms., r. UPPER LOCH FYNE (M.). ARRAN BASIN (M.).—Otterard to Carradale, 18-20 fms., m.c.

BARRIER PLATEAU—Sanda to Achinloan, 19-22 fms., m.c.
 (M.); between Sanda Is. and Ailsa Craig, 24 fms.
 MULL OF CANTYRE, 50 fms.
 SOUND OF MULL, 70 fms.

53. THUIARIA CUPRESSINA (Linn.) (= *Sertularia cupressina*
 of Hincks's "History").

CLYDE SEA AREA (M.).—GARELOCH—across Barrier. LOCH GOIL
 —across Barrier.
 FIRTH OF LORNE, 70-80 fms.
 LOCH BUY 9-15 fms.
 LOCH CARRON, 60 fms. (M.).

(To be continued.)

SCOTTISH PLANTS, CHIEFLY FROM SKYE, PEEBLES, SELKIRK, AND KIRKCUDBRIGHT.

G. CLARIDGE DRUCE, M.A., F.L.S.

(Continued from p. 99.)

- SAGINA SAGINOIDES, *Dalla Torre*, 3400 feet on Ben Lawers, 88.
 S. SUBULATA, *Presl.*—Dunvegan, Lawson MS.; on shingle at
 Sligachan, Skye, 104.
 S. NODOSA, *Fenzl.*—Loch Sligachan, Broadford, 104, Lawson MS.
 SPERGULA SATIVA, *Boenn.*—Portree, 104.
 MONTIA FONTANA, *L.* (*M. lamprosperma*, Chamisso).—The pre-
 vailing form in Scotland, for which the restricted *M. verna*
 Neck., should be queried. St. Mary's Isle, growing in the short
 turf near the mansion, as well as in gravel paths and ditches,
 73; St. Mary's Loch, etc., Selkirk, 79; thus completing the
 comital distribution for the aggregate species. Lawers,
 Crianlarich, etc., Perth M., 88; near Tyndrum, Argyll, 98;
 Fortwilliam, Westerness, 97; Loch Alsh, etc., W. Ross, 105;
 Glen Brittle, in stony debris on the road-side, Sligachan,
 etc., 104. On Loch-na-gar it ascends to 3400 feet. Var.
 BOREO-RIVULARIS at Crianlarich, Loch Alsh, etc. Even when
Montia fontana is reduced to $\frac{1}{4}$ in. in size, the seeds remain
 true to the character, as do those of *M. verna*, even although the
 plant is 5 to 6 inches in length and growing nearly submerged
 as I saw it this year in Jersey.

HYPERICUM ACUTUM, *Moench.*—*Near Walkerburn, Peebles, 78.

H. PULCHRUM, *L.*—Ascends to 2300 feet on Stuich-an-Lochan, 88.

GERANIUM SYLVATICUM, *L.*—Ascends to 3300 feet on Stuich-an-Lochan, 88.

var. *PARVIFLORUM*, *Blytt.*—Kirkcudbright, 73; Lawers, 88.

ANTHYLLIS VULNERARIA, *L.*—Broughton, Innerleithen, etc., Peebles, 78.

MELILOTUS OFFICINALIS, *Lam. (altissima, Thuill.)*.—*In a cornfield near Walkerburn, Peebles, 78.

LOTUS CORNICULATUS, *L.*—A form with slightly ciliate leaves, and very large golden flowers occurred on shingle at Sligachan, 104. It ascends to 3000 feet on Stuich-an-Lochan, 88.

ASTRAGALUS GLYCYPHYLLUS, *L.*—Rather frequent on the cliffs near Port Mary, Kirkcudbright, 73.

VICIA CRACCA, *L.*—A very narrow and rather rigid-leaved form on shingle by Loch Tay, 88.

V. LUTEA, *L.*—**forma LIVIDA*, with pale brown or fawn-coloured flowers, on the cliffs near Port Mary, Kirkcudbright, certainly native, 73.

V. SYLVATICA, *L.*—Watersteen, Skye, 104, Lawson MS.

LATHYRUS SYLVESTRIS, *L.*—St. Mary's Isle, 73.

PRUNUS PADUS, *L.*—Kyle Akin, 104, Lawson MS.

RUBUS SAXATILIS, *L.*—Descends to 50 feet near Sligachan, 104, and ascends to 3300 feet on Stuich-an-Lochan, 88.

GEUM RIVALE, *L.*—Ascends to 3200 feet on Ben Lawers, to 3000 feet on Aonach Mhor.

*var. *PALLIDUM*, *C. A. Meyer.*—Plentiful in East Lothian, S. Anderson, who sent me specimens to name.

G. INTERMEDIUM, *Ehrh.*—Near Traquair, Peebles, 78.

ALCHEMILLA VULGARIS, var. *GLABRA*, *DC.*—St. Mary's Isle, 73; St. Mary's Loch, 79; Sligachan, etc.; the prevailing form in Skye, both as a large-leaved lowland plant, and a small-leaved alpine form. So far these are keeping distinct in culture.

var. *MINOR*, *Huds. (A. filicaulis, Buser, f. vestita, Lind.)*.—Kirkcudbright, 73.

A. ALPINA, *L.*—Descends to sea level on river shingle in Skye, and grows at 50 feet by stream-sides. A form with leaflets slightly connate at base, and with broader and somewhat darker leaf-segments, occurred by Loch Sligachan.

- ROSA EGLANTERIA, *L.*—Peebles, 78; Ettrick, 79.
 var. APRICORUM (*Rip.*).—Dunragit, Sandhead, Wigton, 74; Duns, Berwick, 81.
 var. COMOSA (*Rip.*).—Duns, Berwick, 81.
 var. ECHINOCARPA (*Rip.*).—M. Perth, 88.
 var. ROTUNDIFOLIA (*Rau.*).—Duns, Berwick, 81.
- R. OBTUSIFOLIA, *Desv.*—Yair Bridge, Selkirk, *teste* A. Ley, 79.
- R. BORRERI, *Woods.*—Selkirk, 79.
- R. CANINA, *L.*, var. SPHÆRICA (*Gren.*).—Peebles, 78; Selkirk, 79.
 var. SEPARABILIS, *Déség.*—Thornielee, Peebles, 78.
- R. DUMETORUM, *Thuill.*—
 var. SPHÆROCARPA (*Puget.*).—*Teste* Ley, Galashiels, 79.
 var. PLATYPHYLLA (*Rau.*).—Galashiels, Selkirk, 79, *teste* W. Dod.
 var. SEMIGLABRA (*Rip.*).—Peebles, 78, *teste* W. Dod.
 var. TRICHONEURA (*Rip.*).—Selkirk, 79, *teste* W. Dod.
 var. URBICA (*Lem.*).—Yair Bridge, Selkirk, 79.
- R. HIBERNICA, *Templ.*—Spey side, Easternness 1883, 96, “probably a form of this hybrid,” W. Dod.
 var. GLABRA, *Baker.*—Banffshire, 94.
- R. OMISSA, *Déség.*—Dunragit, Wigton, 74; Galashiels, Selkirk, 79.
 var. RESINOSOIDES, *Crép.*—Drummorie, Wigton, 74; Yair Bridge, Galashiels, Ettrick Bridge, Selkirk, 79, Peebles, 78; Crieff, M. Perth, 88; Ballater, S. Aberdeen, 92.
- R. MOLLISSIMA, *Willd.*
 var. SUBERECTA (*Woods.*).—Peebles, 78; Ettrick Bridge, 79; Selkirk, 79; Gala, Roxburgh, 80; Dunragit, Wigton, *teste* Ley, 74; Forfar, 90; Lawers, 88; Spean, 97; Findhorn, 95; Armadale, Skye, 104; Jamestown, East Ross, 106; Applecross, West Ross, 105; with s.v. GLABRATA (*Scheutz.*), which also occurs at Lawers, 88, and Beaully, 96.
 var. SYLVESTRIS (*Lindley.*).—Ettrick, Selkirk, 79.
 var. SCABRIUSCULA (*Woods.*).—Peebles, 78; Castleton, Caithness, 109.
 var. UNCINATA (*Lees.*).—Duns, Berwick, 81.
 var. PSEUDO-RUBIGINOSA (*Lej.*).—Selkirk, 79.
 var. GLOBULOSA (*Rouy.*).—Beaully, 96.
 var. SHERARDI (*Davis.*).—Lawers, 88.
- R. VILLOSA, *L.*—(*R. mollis*, Sm.), a glandular form, Melrose, C. E. Palmer, 80; and Dunkeld, George Don in Herb. Palmer, *teste* W. Dod.
 var. SUBMOLLIS (*Ley.*).—Drummorie, Wigton, 74; Thornielee, Peebles, 78.
 var. RECONDITA (*Puget.*).—Peebles, 78.

- var. *GRENIERII*, (*Déség.*).—Duns, Berwick, 81; *teste* W. Dod.
- var. *CÆRULEA* (*Woods*).—Port Logan, Wigton, 74; Peebles, 78; Galashiels, 79; Killiecrankie, 89; Dunphail, 95.
- R. *GLAUCA*, *Vill.*
- var. *REUTERI* (*Godet*).—Drummore, Wigton, 74; Galashiels, 79.
- var. *COMPLICATA* (*Gren.*).—Drummore, Wigton, *teste* W. Dod, Peebles, 78.
- var. *SUBSCRISTATA* (*Baker*).—Peebles, 78; Duns, Berwick, 81; Selkirk, 79.
- var. *SUBCANINA* (*Christ*).—Drummore, Wigton, 74; Applecross, West Ross, 105.
- R. *POMIFERA*, *L.*—Dunkeld, George Don in Herb. Palmer,* 89; Ballater by the Dee, Aberdeen S.,* 92.
- R. *CÆSIA*, *Sm.* (*R. coriifolia*, Fries).—Galashiels, 79; Dryburgh, 80; Peebles, 78.
- var. *WATSONI* (*Baker*).—Yair Bridge, Selkirk, 79; *teste* W. Dod.
- var. *PRUINOSA* (*Baker*).—Galashiels, 79.
- R. *SPINOSISSIMA*, *S.*—Dunvegan Head, Sligachan, Kyle Akin, Coruisk, 104, Lawson MS.
- †*ROSA ARVENSIS*, *Huds.*.—*Near Ashiestiel, Selkirk, but possibly planted, 79.
- †*PYRUS ARIA*, *Ehrh.*.—Ashiestiel, probably planted, Selkirk, 79.
- P. *AUCUPARIA*, *Ehrh.*.—Ascends to 3200 feet on Ben Lawers, 88.
- P. *MALUS*, *L.*.—By the Ettrick, Selkirk, 79.
- **CRATÆGUS OXYACANTHA*, *L.*, var. *QUERCIFOLIA*, nov. var.—Leaves with rounder leaf-segments, paler green, sparingly hairy, above and below, leaf-veins recurved, fruit calyx densely hairy, style 1, straight. Locally common about Kirkcudbright. The young leafy branches strongly suggest those of the oak.
- †*SAXIFRAGA UMBROSA*, *L.*.—Naturalised on the railway side near Kirkcudbright, and near Tyndrum, 88.
- SAXIFRAGA STELLARIS*, *L.*, *var. *FONTANA*, *Druce*.—Ben Wyvis, 106, Mrs. Davy.
- S. *CERNUA*, *L.*.—Mr. H. Sanderson of Galashiels has succeeded in hybridising this with *S. granulata*. The hybrid is a tall plant bearing flowers and bulbils.
- S. *AIZOIDES*, *L.*, S. *NIVALIS*, *L.*, and S. *OPPOSITIFOLIA*, *L.*.—At Quirang and Storr, Skye, 104, Lawson MS.
- PARNASSIA *PALUSTRIS*, *L.*.—Between Storr and Steinscholl, 104, Lawson MS.

RIBES RUERUM, var. SPICATUM (*Rob.*).—Uig, abundant on rocks about Dunvegan Head, Skye, 104, Lawson MS.

†SEDUM ALBUM, *L.*—Railway bank near Thornielee, 78.

*S. ACRE, *L.*—Selkirk, 79.

S. VILLOSUM, *L.*—at 800 feet by the Ettrick, growing by the roadside, Selkirk, 79.

*†S. LYDIUM, *Boiss.*—This plant of Asia Minor is naturalised by the river at Clovenfords, Selkirk. It grows in the garden in the village. The first British record.

DROSERA LONGIFOLIA, *L.*—Steinscholl, Skye, 104, Lawson MS.

EPILOBIUM ANGUSTIFOLIUM, *L.*—Dunvegan, Steinscholl, Skye, 104, Lawson MS.

E. ALPINUM, *L.*—Common on the north mountains of Skye.

E. ALSINIFOLIUM, *Vill.*—Quiraing, Storr, 104, Lawson MS.

CIRCÆA ALPINA, *L.*—Quiraing, close to the sea at Steinscholl, 104, Lawson MS.

LIGUSTICUM SCOTICUM, *L.*—Steinscholl, Waterstein, 104, Lawson MS.

*CHÆROPHYLLUM AUREUM, *L.*—This very interesting discovery was made in 1909, by Mr. Fraser, who found it by the Teith at Callander, 87. It clearly shows how much remains to be done at the Scottish Flora since few places have been more visited by botanists than Callander, and yet within a hundred yards of the chief hotel the plant occurs in great plenty, and extends for nearly a mile up the river, and in adjacent pastures in the greatest profusion. I had not time to investigate the river side below the town. Its very abundance has doubtless led to its being mistaken for *C. sylvestre*, from which, however, its spotted and unfurrowed stem easily distinguishes it. Its perennial growth and acute leaf-segments readily separate it from *C. temulum*. It has much the appearance of a native species; but I could not find that it extended up the Leny. It is difficult to explain its occurrence here. At any rate it is completely naturalised; and it was extremely pleasing to see another of the plants which rested upon Don's uncorroborated evidence in such natural surroundings. By the Teith I saw young plants of an American *Aster*, probably aggregate *Novibelgii*, *L.*; while the *Chærophyllum* is a plant of central and eastern Europe, including France and the Pyrenees, and is said to be naturalised only in South Norway. Don found it ("Fasc. Brit. Pl." 207, 1806), by the sides of cornfields between Montrose and Arbroath, and a few plants near Corstorphine, within four miles of Edinburgh; since which time it has not been recorded for Britain. It is figured in "E.B." 2103.

HEDERA HELIX, *L.*—The plant of Glen Brittle and Sligachan, 104, has the upper leaves narrower than in the English form.

†CORNUS STOLONIFERA, *Michx.*—Semi-wild by the Tweed near Peebles, and by the Yarrow, 79.

†C. SANGUINEA, *L.*—By the Yarrow, doubtfully native, Selkirk, 79.

†SAMBUCUS RACEMOSUS, *L.*—Completely naturalised and seeding freely in the woods about Elibank, and very ornamental when the scarlet berries are ripe, Selkirk, 79.

GALIUM BOREALE, *L.*—On shingle by the sea-loch-side, Sligachan, 104.

G. PALUSTRE, *L.*—*var.* WITHERINGII (*Sm.*), Selkirk, 79.

VALERIANA DIOICA, *L.*—Peebles, 78.

†V. PYRENAICA, *L.*—Abundant in St. Mary's Isle, Kirkcudbright, 73.

VALERIANELLA OLITORIA, *Poll.*—Common and certainly native on the cliffs near Port Mary, Kirkcudbright, 73.

GNAPHALIUM SUPINUM, *L.*—On the Falloch side of Creuch Ardran, 88; personal voucher.

ANTHEMIS NOBILIS, *L.*—Steinscholl, 104, Lawson MS.

TANACETUM VULGARE, *L.*—*Near a house, Innerleithen, 78.

ARTEMISIA VULGARIS, *L.*—*Innerleithen, thus completing its comital census, 78.

†DORONICUM PLANTAGINEUM, *L.*—*In great quantity, St. Mary's Isle, 73.

ARCTIUM MINUS, *Bernh.*—*Selkirk, 79.

*A NEMOROSUM, *Lej.*—Near Lunan, Forfar, 90, with Mr. and Mrs. Costorphine.

CENTAUREA CYANUS, *L.*—Galashiels, Selkirk, 79.

†ONOPORDON ACANTHIUM, *L.*—Waste ground, Galashiels, Selkirk, 97, with Miss Hayward.

CARLINA VULGARIS, *L.*—Waterstein, 104, Lawson MS.

CARDUS ACANTHOIDES, *L.*—Dryburgh, 80.

SAUSSUREA ALPINA, *DC.*—Sparingly, Quiraing, abundant on Cuchullins, 104, Lawson MS.

CREPIS CAPILLARIS, *Wallr.*, **var. runcinata* (*Bisch.*)—Lawers, plentiful, and consistently of this form, in a cornfield, 88.

LEONTODON HISPIDUS, *L.*—*Tyndrum, 88.

L. AUTUMNALIS, *L.*—Ascends to 3200 feet on Ben Lawers, 88.

TARAXACUM SPECTABILE, *Dahlst.*—*Kirkcudbright, with var. MACULIGERUM (*Dahlst.*): St. Mary's Loch, 79; Crianlarich, 88; Fort William, 97; Near Tyndrum, 98; Sligachan, 104.

T. PALUDOSUM, *Schlecht.*—*Kirkcudbright, 73.

HIERACIUM PILOSELLA, *L.*—ascends to 2800 feet on Ben Lawers.
var. NIGRESCENS, *Fr.*—*Sligachan, 104.

H. VULGATUM, *Fries.*—Symington, Lanark, 77.

H. ACROLEUCUM, *Stenstr.*—*Symington, Lanark, 77.

H. STICTOPHYLLUM, *Dahlst.*—*Symington, Lanark, 77.

H. PRENANTHOIDES, *Vill.*—Ettrick Bridge End, Selkirk, 79.

H. EXIMIUM, *Backh.*—Ben More, Sutherland W., Mrs. Davy.

CERVICINA HEDERACEA, *Druce.*—*Near Newton Stewart, Kirkcudbright, 73.

OXYCOCCOS QUADRIPETALA, *Gilib.*—Near Loch Brittle, Dr. Webster in Lawson's MS., Skye, 104.

ARCOSTAPHYLLOS UVA-URSI, *Spreng.*—Near sea level at Sligachan, 104. Lawson noticed it at Storr and Dunvegan, and abundantly on the limestone at Broadford and Kyle Akin, Rev. Mr. Mathieson.

PYROLA SECUNDA, *L.*—Sligachan, 104, Lawson MS.

PRIMULA VULGARIS, *Huds.*—*Near Traquair, Peebles, 78, thus completing its comital census.

SAMOLUS VALERANDI, *L.*—Loch Scavaig, 104, Lawson MS.

†ANCHUSA SEMPERVIRENS, *L.*—Established in several localities about Selkirk, 79.

SYMPHYTUM PEREGRINUM, *Ledeb.*—Galashiels, 79.

†LINARIA CYMBALARIA, *Mill.*—On a wall, Sligachan, 104.

†MIMULUS GUTTATUS, *DC.*—Tyndrum, 88; Sligachan, 104. It was noticed at Dunvegan and Broadford by Lawson.

VERONICA HEDERIFOLIA, *L.*—*Innerleithen, 78; *Sligachan, 104.

V. MONTANA, *L.*—St. Mary's Isle, 73; Dunvegan, 104, Lawson MS.

V. OFFICINALIS, *L.*, *var. HIRSUTA, *Williams*—(Very doubtfully *V. hirsuta*, Hobkirk) from Carrick, Ayr. It is much smaller than typical *officinalis* and more hairy; but its chief difference is in the capsule being unnotched at the top, and in the much smaller and narrower leaves. The capsule, too, is said to be seedless. It kept true in cultivation.

At Elibank I found on a dry bank a small form of *V. officinalis* with more hairy leaves and an entire capsule, with seeds, which would come under Dr. Williams's description as

given in the *Prodromus*, pars vi., p. 297 ; but I doubt its being Hopkirk's plant. I should propose to call it var. *truncata*, had it not been for Mr. Beeby's statement ("Scot. Nat." 1889, p. 36) that in the very same plants the withered flower-stalk of the previous year bore deeply notched capsules, indicating that the serration is due to some merely temporary cause.

EUPHRASIA BREVIPILA, *Burnat.*—Ettrick, Selkirk, 79.

E. NEMOROSA, *H. Mart.*—Drumore, Wigton, 74.

E. CURTA, *Fries.*—Ettrick, 79.

*RHINANTHUS STENOPHYLLUS, *Schur.*—Sligachan, 104.

UTRICULARIA MAJOR, *Schmid.*—*Cluny Loch, 89 ; *Loch Mallachie, 96 ; Selkirk, 79, named for me by Professor Glück.

*U. OCHROLEUCA, *Hartm.*—Loch Mallachie, 1882, 96 ; Scourie, 107, also named for me by Dr. Glück. N. Uist, 110, 1894 ; and Loch of Spiggie, Shetland, 112, in Herb. Brit. Mus.

U. MINOR, *L.*—Brackish pools, Steinscholl, Sligachan, 104, Lawson MS.

OROBANCHE RUBRA, *Sm.*—Waterstein, Skye, 104, Lawson MS

MENTHA ALOPECUROIDES, *Hull.*—Tyndrum, 88.

M. PIPERITA, *L.*—*Sligachan, in some plenty, 104.

THYMUS OVATUS, *Miller.*—Mull of Galloway, 74 ; Peebles, 88 ; Selkirk, 79 ; Glen Brittle, etc., Skye, 104.

T. PRÆCOX, *Host.*—*Sligachan, 104 ; varying with flowers of a deep violet colour, and, of course, with the two forms of flowers.

NEPETA HEDERACEA, *Trev.*—A large-flowered hairy form on the cliffs at Port Mary, 73.

GALEOPSIS LADANUM, *L.*—Steinscholl, 104, Lawson MS.

MARRUBIUM VULGARE, *L.*—*Galashiels, on waste ground, with Miss Hayward, 79.

STACHYS OFFICINALIS, *Trev.*—Steinscholl, 104, Lawson MS ; both records queried in "Top. Bot."

S. AMBIGUA, *Sm.*—Tyndrum, 88.

TEUCRIUM SCORODONIA, *L.*—Peebles, 78.

PLANTAGO MARITIMA, *L.*, var. *MARITIMA* (*sensu* Williams, doubtful if of Linn.).—*Sgur Alastair, Skye, 104.

P. CORONOPUS, *L.*—Waterstein, 104, Lawson MS.

ATRIplex PATULA, *L.*—Kirkcudbright, 73.

POLYGONUM BISTORTA, *L.*—St. Mary's Isle, 73.

P. VIVIPARUM, *L.*—Storr, Cuchullins, 104, Lawson MS.

P. LAPATHIFOLIUM, *L.*—*Sligachan, 104.

OXYRIA DIGYNA, *Hill.*—At sea-level, Sligachan, 104.

URTICA DIOICA, *L.*—At 2900 feet on Stuich-an-Lochan, 88.

†ULMUS GLABER, *Mill.*—Callander, 87; probably planted.

†FAGUS SYLVATICA, *L.*—Selkirk, 79.

BETULA ALBA, *L.*—Sligachan, 104.

†POPULUS MAJOR, *Mill.* (*P. canescens*, Sm.).—Selkirk, but doubtless planted, 79.

†P. EU-NIGRA, *L.*—Selkirk.

†P. DELTOIDES, *Marsh.*—Kirkcudbright, 73; Selkirk, 79; Peebles, 78; Melrose, Roxburgh, 80; Callander, 87; planted of course.

†SALIX FRAGILIS, *L.*—Sligachan, doubtless planted, 104.

JUNIPERUS SIBIRICA, *Burges.*—Near sea-level, Sligachan, 104.

LISTERA CORDATA, *Br.*—Kyle Akin, 104, Lawson MS.

ORCHIS MACULATA, *L.*—Type, Selkirk, Kirkcudbright, and on Ben Lawers, also a form with nearly undivided labellum, with broader and blunter leaves.

var. PRÆCOX, *Webster* (*O. ericetorum*, Linton).—St. Mary's Loch, 79; Lawers, 88; Sligachan, 104; and also with pure white flowers; intermediate forms between *præcox* and type occur.

O. MACULATA × HABENARIA GYMNADENIA.—One specimen as found at Lawers, growing with both parents. The spur was shorter than in *Gymnadenia*; but the lateral petals were broader and were, with the labellum, covered with darker markings. The leaves were narrow and the outline of the spike less cylindric than in *Gymnadenia*, the flowers were also fainter in odour.

*O. LATIFOLIA × MACULATA, var. PRÆCOX.—Sconser, Skye, with both parents, a rich-coloured and handsome plant, the flowers larger and distinctly suggesting the influence of *maculata*, and vegetatively much more luxuriant.

O. MACULATA, *L.*, var. KELLYI, *Druce.*—To this must be referred, I think, the Inchnadamph plant gathered by the Rev. E. S. Marshall. This year I have had the opportunity of seeing it in the fresh state from N. Sutherland. This, too, is the opinion of Mrs. Davy, who made a most beautiful painting of the Irish form. The Scottish plant, like the Irish, is occasionally tinged with pink. Doubtless it is the limestone analogue to the plant of the peat named var. *præcox* by Webster; the type *maculata* being essentially the plant of argillaceous soils.

O. MAScula, *L.*—St. Mary's Isle, 73.

HABENARIA ALBIDA, *Br.*—Sconser, Skye, 104; lacking personal authority in "Top. Bot."

- H. GYMNADENIA, *Druce* (*H. Conopsea*, Benth.).—Plants with pure white flowers were noticed at Sconser, 104; and at Lawers, 88.
- H. VIRIDIS, *Br.*—Quiraing, between Steinscholl and Storr, 104, Lawson MS.
- H. VIRESCENS, *Druce*.—Near Sconser, abundant, with *H. bifolia*, *Br.* (at Steinscholl, Lawson MS.). A single specimen was found with five regular petals, no spurred labellum, the petals being nearly of the same size, Sconser, 104.
- *H. BIFOLIA \times VIRESCENS.—With the above a single specimen of an intermediate plant was found, the anther lobes very slightly converging; the spur and colouring were intermediate, on the whole perhaps nearer to *bifolia*. I don't think it has before been recorded for Britain.
- ALLIUM SCORODOPRASUM, *L.*—St. Mary's Isle, 73.
- SCILLA NONSCRIPTA, *Link.*—Nothing could have been more beautiful than the profusion of this plant, intermixed as it was with the white-flowered, double-blossomed *Saxifraga granulata*, in St. Mary's Isle, or as it grew on the coast cliffs in cascades of colour, which were crowned at the summit with golden Furze.
- JUNCUS TRIGLUMIS, *L.*—Ascends to 2400 feet in Perth. (Storr and Cuchullin, 104, Lawson MS.)
- J. TRIFIDUS, *L.*—Ascends to 4200 feet on Ben Nevis.
- J. BIGLUMIS, *L.*—On range of mountains between Storr and Quiraing, 104, Lawson MS.
- JUNCOIDES MULTIFLORUM, *Druce*, and as *var. CONGESTUM* (*DC.*).—Sligachan, 104.
var. PALLESCENS (*Hoppe*, not of Besser).—*Crianlarich, 88.
- J. SYLVATICUM, *O.K.*—Ascends to 3000 feet in Perth.
- ERIOPHORUM PANICULATUM, *Druce* (*E. latifolium*, *Hoppe*).—*In several stations near Sligachan, 104; also seen near Tyndrum, 88.
- SCIRPUS RUFUS, *Wahl.*—Near Loch Harbort, abundant, 104.
- S. MARITIMUS, *L.*—Uig, 104, Lawson MS.
- CAREX PAUCIFLORA, *Lightf.*—M'Leod's Tables, 104, Lawson MS.
- C. DISTICHA, *Huds.*—Selkirk, 79.
- C. RIGIDA, *Good.*—At 4350 feet on Ben Nevis.
- C. GOODENOWII, *Gay.*—*var. CHLOROSTACHYA* (*Reichb.*).—Crianlarich, 88; Tyndrum, 98; Sligachan, 104.
var. RECTA, *A. and G.*—Peebles, 78; St. Mary's Loch, 79; Crianlarich, 88; Tyndrum, 98; Sligachan, 104.
- C. PALLESCENS, *L.*—Dunvegan, 104, Lawson MS.
- C. PENDULA, *Huds.*—Abundant on sea-cliffs in Kirkcudbright, 73.
- C. FULVA, *Host.*—Creach Ardran, 88; Sligachan, 104.
- C. BINERVIS, *Sm.*, *var. ALPINA*, *Drej.*—Corrie Ardran, 88; Falloch, 87.

- C. FLAVA*, *L.*—Ascends to 3300 feet on Ben Lawers.
- C. LEPIDOCARPA*, *Tausch.*—*Sgur Alastair, Sligachan, 104.
- C. CÆDERI*, *Retz.*—Sligachan, 104.
var. *CÆDOCARPA*, *Anders.*—Sligachan, 104.
- C. XANTHOCARPA*, *Déség.*—Sligachan, 104 (*C. fulva* × *flava*).
- C. INFLATA*, *Huds.*, var. *BRUNNESCENS* (*Anders.*).—Corrie Ardran, 88.
- C. INFLATA* × *VESICARIA*.—*Plentiful by the Teith, near Callander, with both parents.
- C. VESICARIA*, *L.*—Lacked personal authority in "Top. Bot." for 87.
- ANTHOXANTHUM ODORATUM*, *L.*—At 3600 feet on Ben Nevis.
- SAVASTANA ODORATA* (*L.*), *Scribn. (Hierochloa borealis, R. and S.)*.—Still exists in small quantity on the Kirkcudbright coast.
- DESCHAMPSIA ALPINA*, *Beauv.*—Corrie Ardran, 88.
- D. CÆSPITOSA*, *Beauv.*, var. *ALPINA*, *Gaud.*—*Cuchullins, 104; ascends to 4300 feet on Ben Nevis.
- AVENA PUBESCENS*, *Huds.*—Grassy bank, near Walkerburn, 78; by the Yarrow in pastures in several places, 79.
- A. ALPINA*, *Sm.*—Stuich-an-Lochan, abundant, ascending to 3300 feet.
- ARRHENATHERUM TUBEROSUM* (*Gilib.*), *Druce.*—*Sligachan, 104; Lawers, 88.
- POA ANNUA*, *L.*, var. *PICTA*, *Beck.*—*Corrie Ardran, 88; *Ben Nevis, 97; *Cuchullins, 104.
- P. ALPINA*, *L.*—Steinscholl, 104, Lawson MS.
- P. NEMORALIS*, *L.*—*St. Mary's Isle, 73.
- P. PRATENSIS*, *L.*, var. *SUBCÆRULEA* (*Sm.*).—*St. Mary's Isle, 73; *St. Mary's Loch, 79; Corrie Ardran, 3300 feet, 88; *Sligachan, 104.
- GLYCERIA MARITIMA*, *Wahl.*—Portree and Sligachan, lacked personal authority for 104.
- BROMUS HORDEACEUS*, *L.*, var. *GLABRATUS*.—*Sligachan.
- HORDEUM MURINUM*, *L.*—*Galashiels, 79.
- ASPLENIUM MARINUM*, *L.*—Very fine on Kirkcudbright coast, 73.
- DRYOPTERIS ÆMULA*.—Kyle Akin, 104, Lawson MS.
- OSMUNDA REGALIS*, *L.*—Orbost, Loch Scavaig, 104, Lawson MS.
- BOTRYCHUM LUNARIA*, *Sw.*—On a turf-topped wall near Sligachan, 104.
- EQUISETUM MAXIMUM*, *Lam.*—Steinscholl, 104, Lawson MS.
- E. HYEMALE*, *L.*—Lake between Loch Staffin and the Storr, 104, Lawson MS.
- PILULARIA GLOBULIFERA*, *L.*—Steinscholl, 104, Lawson MS.

MAN'S INFLUENCE ON THE INDIGENOUS FLORA OF ABERDEEN.

By JAMES W. H. TRAIL, A.M., M.D., F.R.S.

DURING a number of years my attention has been directed to the plant life of the North-east of Scotland, and more especially to the plants growing in the neighbourhood of Aberdeen apparently wild, or as weeds among crops and on waste ground. All available information has been collected from published records, old herbaria, and other sources that can throw light on the past state of the flora; but these are unfortunately scanty, and scarcely extend beyond 1750.

My aim has been to trace, as far as in my power, the changes that have occurred since the beginning of the historic period, and to ascertain their causes. Among these man's influence has been increasingly potent; indeed, it has become difficult within the boundaries of the city to realise how great an effect that influence has had on the flora, and to realise how recent much of the effect has been.

The earliest published map of Aberdeen and the surrounding country is that of the "parson of Rothiemay," the Rev. James Gordon, son of Robert Gordon of Straloch, whose Atlas of Maps, published in 1648, and in later editions, supplied the first trustworthy information of this kind on Scotland. The map of Aberdeen was prepared at the request of the Town Council of Aberdeen, probably between 1650 and 1660, and bears the date 1661 on the published map. From it and from an accompanying description of Aberdeen and of Old Aberdeen we see how very small an area was then occupied by houses, and that the two small towns were about $\frac{3}{4}$ mile apart at their nearest points. Aberdeen shows a few houses along the estuary of the Dee (where a quay gave access for shipping) and its tributary the Denburn, which since 1860 has disappeared from view in a covered channel. From this quay a main street (the Shiprow) ran northward following a ridge, as it still does, to the Market place (now Castle Street), from which opened several narrow closes or wynds. These have been largely

cleared away to permit of the formation of Union Street from 1800 onwards, a change of vital importance in the growth of the city. The streets were few and extended along the higher parts of the naturally undulating site, but, as in most towns of the same age, they did not extend far, although Aberdeen does not seem to have been hindered in its expansion by a city wall for defence. Gordon's map and description show that gardens and trees were numerous, covering the slopes of the ridges on which the streets lay, and that fields were cultivated close to the town, where the soil was suitable; but they also show large marshes in the hollows, and a loch covering several acres now under streets.

Moors and rough broken ground strewn with boulders and ice-borne debris covered much of the surface at a short distance from the town, and formed a surrounding belt of several miles in width, except in the lower part of the valleys of the Dee and the Don. Maps of considerably more recent date show these features almost unchanged, and the area covered by streets was little extended until towards the close of the eighteenth century. About the middle of that century efforts were directed to bring parts of the rough ground around the town into cultivation; and great progress was made in this direction during the next fifty years. In many cases it cost large sums to clear the surface of the stones, exceeding £30 per acre in some places; but much, if not all, of the cost is said to have been repaid by the price obtained for the stones, which were exported for building and for other uses. From 1800 onwards Aberdeen spread over a rapidly enlarging area, especially from 1860 to 1900; and the municipal limits were moved outwards several times. In 1893 they were determined as at present, occupying an extent of more than ten square miles, bounded by the Don on the North and including a strip of Kincardineshire south of the Dee.

Within this area the surface has undergone very great changes; moors and marshes have almost completely disappeared, the soil having been drained and converted into agricultural ground where fit to be so used, or covered with buildings, or roads and streets, or enclosed as pleasure-grounds

and public parks. The numerous streams have been largely carried in channels underground, the valleys have been filled up, and the heights frequently lowered, until it has become difficult to recognise the features shown on the earlier maps. The estuary of the Dee, originally of considerable extent, has disappeared except in so far as it is occupied as a harbour, a new channel being cut before 1870, for about a mile of the river's course, and much of the former estuary being afterwards filled with rubbish of all kinds, and built over. Where rock comes to the surface it has been quarried in several places. Most of the quarries within the municipal area have ceased to be worked, and in one or two places can no longer be traced; but some remain more or less filled with water, and surrounded with piles of debris.

Less change is apparent on the sandy coast and dunes between the Dee and the Don, and on a strip of varying width inland from the dunes, part of it, near the Don, liable to be flooded by high tides; but even here there has been considerable changes made in recent years, and they are likely to be still greater in the immediate future.

The flora in and around Aberdeen has been greatly affected by the alterations of the surface; but actual records by botanists are few prior to 1830, and none go back to 1750. However, in view of the evidence, stated above, that the town-area was small until considerably after 1750, and that there had been few attempts made to reclaim the rough and barren soils except in the immediate neighbourhood of the town, it may safely be assumed that over much of what is now covered by Aberdeen the natural flora grew almost unchanged by man. There still existed lochs, swamps, and streams, moors and peat-mosses, rough thickets by the streams, estuaries little, if at all changed, shingles and marsh by the rivers, and dunes in their natural condition along the coast. The streams had not been polluted with domestic sewage or industrial waste, except that the dyers seem to have discharged coloured refuse into the Loch, which was probably in a not very clean state. It seems likely that no plantations, and certainly no natural woods, existed near the town. Peat was probably still cut from mosses within the area, as at Ferryhill, where an old peat-moss was a

well-known home of several plants until it was drained about 1850.

One or two fragments of moor still exist west of Rubislaw, but the last moor worth the name disappeared from Aberdeen when Stocket Moor was broken up and cultivated, about 1880.

The endeavour to ascertain what was known of the flora of Aberdeen in the past appeared for a time likely to show only manuscript notes by Dr. David Skene, a native of Aberdeen, who at the time of his death in 1771, was one of the leading physicians of the North of Scotland. In professional visits over a district extending beyond Inverness he was an unwearied recorder and a naturalist in the best sense. He corresponded with Ellis, Linnæus, and others of the best-known naturalists of the time. Though he died, it is believed, at the age of 39, and had been in poor health for a number of years, he left a large quantity of manuscript notes in all departments of science; but his interest seems to have been keenest in the flora and fauna. Many of the plants and animals found by him are described very fully, especially when from his books he could not discover their names; and so careful are these descriptions that in most cases there is little room for doubt of the species, except with critical forms. But while he proves the existence of many plants in this part of Scotland prior to 1771, he does not often name definite localities within what are now the limits of the city.

The next to study the plants of this neighbourhood was James Beattie, Professor of Natural History in Marischal College and University. He was a nephew of James Beattie, Professor of Moral Philosophy in the same University (a poet and philosophical writer of high repute for a time); and the uncle and nephew have been confused in even so trustworthy an authority as the "Biographical Index of British and Irish Botanists." The younger man was a keen and an accurate botanist. The chief published evidence of his botanical studies is found in Sir J. E. Smith's acknowledgments of the Carices sent from near Aberdeen by Dr. Beattie, some of which Smith described as new species. Not long ago I found a number of pencil-notes by Beattie

in a copy of Hudson's "Flora Anglica"; and subsequently purchased at a sale his copy of Lightfoot's "Flora Scotica," with additional notes by him. Some of these notes give evidence of the occurrence of plants in localities from which they have long disappeared. He died in 1810, aged 43. His successor in the chair of Natural History was of very different and inferior type; but the investigation of the plants of Aberdeen was continued by one of those taught by Beattie, Dr. William Knight, who, though Professor of Natural Philosophy in Marischal College, taught Botany there, as lecturer, for a number of years. He published little, but he left a great amount of manuscript on many subjects. Among other notes are lists of plants observed in various localities in and near Aberdeen, during excursions of his classes and at other times.

In 1836 appeared the first published work on the flora of the North of Scotland, "The Northern Flora," Pt. I., by Dr. Alexander Murray, including about a third of the flowering plants. It is most careful and suggestive, containing many personal observations, but the author's early death prevented the completion of the work. The "Flora Abredonensis" by Dr. George Dickie, in 1838, gave a list of the higher plants of Aberdeen and of a district of about 15 miles radius around; and it was followed in 1853 by "A Catalogue of the Flowering Plants and Ferns growing in the neighbourhood of Aberdeen, by Paul H. Macgillivray, son of the well-known Professor William Macgillivray, who had taught botany in Marischal College for some years before his death in 1852, and had collected the plants of the district. Dr. Dickie in 1860, just after his appointment to the newly founded chair of Botany in the University of Aberdeen, issued his "Botanist's Guide to the Counties of Aberdeen, Banff, and Kincardine."

In these various lists a number of localities within Aberdeen are named under both native and alien species where the plants do not (and often could not) now exist; but this applies chiefly to the rarer or more local plants; and the information they contain has been supplemented by the use of collections made prior to 1850 which have come into my possession, or which I have been permitted to examine.

From these sources, and from a comparison with the plants still found at distances not exceeding a few miles from Aberdeen under conditions similar to those that prevailed formerly within its present limits, it is possible to realise in some degree the changes that the flora has undergone since 1750. Before that date the destruction of the native woods seems to have been almost if not quite complete, and with them must have gone most of the plants that prefer their protection. Among the influences most destructive in their effects on the native flora were the changes due to the drainage of the wet hollows, in part occupied by peat-mosses and in part by marshes not on peat; and numerous species have become extinct in this way. Others have disappeared in consequence of the alterations at the mouths of the Dee and Don, and on the Links between the rivers.

(*To be continued.*)

NOTES ON THE GENUS POTAMOGETON OF THE LONDON CATALOGUE. ED. 10.

By ARTHUR BENNETT.

IN the "Journal of Botany" (1907), pp. 172-76, I remarked on some forms of the genus new to Britain. In this note I run through the names and add, or reject, as later knowledge suggests.

1. *P. NATANS*, *L.*, var. *TERRESTRE*.—Gray, "Nat. Arr. Brit. Pl." (1821), p. 33. Woking, Surrey, A. Bennett.
2. *P. POLYGONIFOLIUS*, *Pourr.*, var. *AMPHIBIUS*.—Fries, "Nov. Fl. Suec." (1828), p. 30 (= *ericetorum*, Syme).
var. *SPHAGNOPHILA*.—Neuman, "Bot. Not." (1896), 91. Moidart, Argyll, Symers Macvicar, *sp.*
var. *CORDIFOLIA*.—Asch. et Graeb., "Syn. Fl. Mitt. Europ." (1897), p. 306.
A large cordate-leaved form, not uncommon.
- P. POLYGONIFOLIUS* × *NATANS* (= *P. Gessnacensis*).—Fischer, in "Ber. Bayr. Bot. Ges.," xi. (1907), p. 20. Rudha Gheadha, Isle of Colonsay, Argyll, M. M'Neal, *sp.*

3. P. *ANGUSTIFOLIUS*, *Berdch et Presl.*, var. *LACUSTRIS*, *Ar. Benn.* (= *lucens*, var. *lacustre*, Thore).
Mr. Fryer objects to the name *angustifolius* × *coloratus* as representing his × *P. Billupsii*, the correct name being "*coriaceus* × *Zizii*," or *lacustris* × *coloratus* of the "Catalogue."
4. P. *HETEROPHYLLUS*, *Schreb.*, var. *TERRESTRIS*.—Schlecht, "Fl. Berol." (1823), i. p. 116.
5. P. *NITENS*, *Weber*, var. *MAXIMUS*, *Ar. Benn.*—Delete, and substitute var. *prælongifolius*, Tiselius !.
6. P. *PERFOLIATUS*, *L.*, var. *MACROPHYLLUS*.—Blytt, "Norges Flora" (1861), p. 367, River Isla, E. Perth, 1882, A. Sturrock, *sp.*
var. *PSEUDO-DENSUS*, *Asch. et Graeb. l.c.*—Loch Brotachan, S. Aberdeen, alt. 2300 ft., Marshall, *sp.*
var. *CORDATO-LANCEOLATUS*, *Mert. et Rich.*—"Deut. Flora" (1823), p. 852. Not uncommon.
var. *RICHARDSONII*, *Ar. Benn.* (= var. *lanceolatus*, Robbins, *non* Blytt).—Very common in the Great Lakes and westward in North America; Mill-dam, Selkirk (1876), Brotherston, *sp.*; Loch Ordie, E. Perth (1898), W. Barclay, *sp.*
7. P. *PRÆLONGUS*, *Wulf.*, var. *ANGUSTIFOLIUS*, *Graeb.* (= var. *folio-angustifolia*, Hooker).
8. P. *ALPINUS*, *Balb.*, var. *SPATHULIFOLIUS*, Fischer, *l.c.*—Black Loch, Cleish Hills, Fife, G. West, *sp.* Loch Fada, Colonsay, Argyll, M. McNeill, *sp.*
9. P. *PUSILLUS*, *L.*, var. *ACUMINATUS*, *Ar. Benn.*—Delete, as there is *acuminatus* of Fieber (1836), and substitute var. *similis*.
10. P. *RUTILUS*, *Wolff.*—Probably limited to Anglesea. The Stafford (?) specimens are somewhat doubtful, though decidedly near to Nolte's *cæspitosus*.
11. P. *FILIFORMIS*, *Nolte*, var. *ALPINUS*.—Blyth, *l.c.*, substitute *P. marinus*, *L.*

ZOOLOGICAL NOTES.

An Old-time Vermin List: a Correction.—Since sending you, as not previously published, "An Old-time Vermin List," see pages 110-111, I have discovered that I was wrong in thinking that this list had not before appeared in print. It is to be found on pages 158-159 of the "Edinburgh New Philosophical Journal," vol. xx., 1836; being part of a paper by P. J. Selby, F.R.S.E., F.L.S., etc., etc., read before the Wernerian Natural History Society, on 21st

Nov. 1835, "On the Quadrupeds and Birds inhabiting the County of Sutherland, observed there during an Excursion in the Summer of 1834" (pp. 159-161 and 286-295). The list there given is exactly similar, but the following information is added:—The Crows killed were "all of the species *Corvus Cornix*, Hooded Crows"; and as regards the "548 King-Fishers," Selby notes, "The Dipper is so called throughout Sutherland and other parts of the Highlands. The *Alcedo Ispida* is rarely seen." From another part of the paper we learn that Mr. Baigrie was "the intelligent Factor of the Scourie and Assynt districts." The list which I transcribed for you is undoubtedly the original list sent by Mr. Baigrie to Sir William Jardine, and presumably lent by him to P. J. Selby for use in the compilation of his paper above referred to.—HUGH S. GLADSTONE, Thornhill, Dumfriesshire.

[To those of our readers who may not be aware of the existence of an even earlier certified List of Vermin killed upon the same estates, and paid for by the "Sutherland Association for the Protection of Property," between the years from July 1819 to August 1826, it may be of interest to compare that list with the one given by Mr. Gladstone in the April No. of "The Annals," above referred to, dating, as shown, between March 1831 and March 1834.

It would almost appear on such a comparison as is above suggested, that "Kingfishers" (*i.e.* Dippers) were *not* considered *vermin* by the members of "The Association" in 1819 to 1826, but that they were killed down to a frightful extent in 1831 and to 1834.

Personally, I can vouch that even as late as 1867 or thereby, Dippers were mercilessly slain and a premium put upon their *heads*, and I may perhaps yet again be permitted to take credit to myself that I was instrumental in having a stop put to the barbarous practice—my influence with my old friend, Mr. Evander M'Iver of Scourie, who was then Factor for the Assynt and Edderachyllis parish estates of the late Duke of Sutherland, getting the head-money shifted from the innocent "Water-crow" to the Prince of Ruffians, the "Hooded Crow." Those who are sufficiently interested will find the earlier list I refer to in vol. i. of our "Vertebrate Fauna of Scotland," Appendix, p. 301.—J. A. HARVIE-BROWN.]

Mealy Redpolls in Aberdeenshire.—Several small flocks of Mealy Redpolls—up to a score in number—appeared in this neighbourhood (Old Aberdeen) on 21st, 23rd, and 30th October last. Mr. Eagle Clarke kindly identified a specimen which I sent him, as *Acanthis linaria linaria*, Aberdeen.—L. N. G. RAMSAY. ¶

Nesting of Pied Flycatcher in East Lothian.—As I had previously seen a male Pied Flycatcher (*Muscicapa atricapilla*) frequenting a patch of wood $2\frac{1}{2}$ miles from Haddington, I made a thorough search on 26th May and after a little came upon both

cock and hen birds near a rotten ash-tree. I eventually managed to climb to a hole 10 feet from the ground, and on looking down, assisted by a gleam of sunlight, I saw clearly two green-blue eggs at the end of a cavity nine inches deep, with a very narrow entrance-hole. There were probably more eggs, but the light only showed me two. I returned on 31st May and 1st June and watched both birds going in and out of the hole, and got several photographs of them both. The hen was so tame that she sat unconcernedly on the eggs while I looked in at her. The male's song surprised me. I did not know that this species had anything more than a call note. I have seen this bird in the country before, but as it was not paired, I suppose it did not sing. The cock entered the nesting-hole with food in his bill for the sitting hen on several occasions.—H. N. BONAR, Saltoun.

Icterine Warbler in Shetland.—A fine specimen of *Hypolais icterina* was obtained near Lerwick on the 15th of May 1910, a day on which a number of migratory birds were observed on passage. It was observed on the lee side of a hill some distance from the town, where Redstarts and Blackcaps were also present. I had always been a little doubtful as to its identity, and recently sent the specimen to Mr. Eagle Clarke for his opinion on it. I believe this is only the second record of the occurrence of this species in Scotland, the previous known visit having been obtained at Fair Isle in 1908.—GEORGE W. RUSSELL, Lerwick.

Continental Great Spotted Woodpecker in Aberdeenshire.—It may be useful to record that a Great Spotted Woodpecker which occurred near the village of Sauchen in December 1909 belongs to the Continental race *Dendrocopus major major*. Having seen several records of the visits of birds of this race to Scotland, I thought it well to send my specimen to Mr. Eagle Clarke for precise determination.—DAISY HAMILTON, Skene House, Aberdeenshire.

Wigeon Nesting on Loch Awe.—That the Wigeon nests on Loch Awe was established by the Misses Baxter and Rintoul who found a nest there on 27th May 1908, as reported at the time in the "Ann. Scot. Nat. Hist." A nest was found on 10th May last by Colonel Lister Kay of Cladich on one of the islands of Loch Awe, and an egg, down, and flank feathers identified by Mr. J. A. Harvie-Brown. Several pairs of Wigeon were seen by the same observer in April, and later the drakes by themselves.—CHAS. H. ALSTON, Letterawe, Loch Awe.

[To the above note by Mr. Alston I may add that Mr. William Evans informs me that he knew of their breeding in the Loch Awe district about ten years ago, and has a note of a nest found there by Mr. R. Godfrey, on 25th April 1906. I am aware of their having bred in fair numbers on the Moor of Rannoch as long ago as 1874, which district is not far removed from the valley of the Orchay, *via*

Loch Tulla in the Black Mount Deer Forest, by which route there can be little hesitation in saying they in all probability advanced southwards to Loch Awe. I am unaware whether any earlier record than the above of their nesting at Loch Awe exists.

I did not observe any flank feathers amongst the down and grass tufts, etc., sent by Mr. Alston. If there were any flank feathers they escaped my observation. My servant cleaned the down and picked out all foreign addenda, as instructed by me. Mr. W. Evans saw the egg and the down, and at once confirmed my identification. I understand the round glass-topped box containing the down and egg were afterwards presented to Miss Baxter by Mr. Chas. H. Alston.—J. A. HARVIE-BROWN.]

Turtle Dove on the Isle of May.—On 1st June 1911, I put up a Turtle Dove (*Turtur turtur*) in the lighthouse superintendent's garden on the Isle of May, where it was again met with an hour later.—WILLIAM EVANS, Edinburgh.

Extension of the Capercaillie in Moray.—Hearing that Capercaillies had recently appeared frequenting forest-ground near Inverness, I made enquiry. Captain Fleming, of Fairburn, writes that about four years ago Capercaillies were installed as a nesting species on that property, and since then, they have increased in numbers and are frequently seen, but none have as yet been shot. He had also heard of a bird having been seen at Scatwell, but does not vouch for it. The nearest place to Fairburn that they had been heard of before this, was Belladrum. It is well to note such finger-posts in dispersal as early as possible, and I wish I could furnish more details, because the longer such statistics are delayed the more difficult it becomes, to obtain them correctly—not only of this, but of all species which are extending their areas of distribution.—J. A. HARVIE-BROWN.

Gadwall in Barra.—Not “as recorded in ‘A Fauna of the Outer Hebrides,’ Appendix D, p. 254,” a *Garganey*. The error consists in the misapplied name *Anas strepera*, “Garganey Duck” (*sic*). The correct note will be found in Graham's “The Birds of Iona and Mull,” and had been correctly given by Robert Gray in his “Birds of the West of Scotland.” I cannot now at this late date account for the error except as a *lapsus calami*, and regret that it should have so long remained unchecked, my attention not having been directed to it until mentioned to me by Mr. Wm. Evans a day or two ago.—J. A. HARVIE-BROWN.

Pisidium amnicum in Haddingtonshire, Sphærium lacustre in Stirlingshire, and Limax maximus in Shetland.—On 13th May 1911, I found a few examples of *Pisidium amnicum* in the river Tyne, below East Linton, Haddingtonshire, and on the 25th of the same month several of *Sphærium lacustre* in the duck pond, at

Dunipace, Stirlingshire. Specimens have been submitted to Mr. J. W. Taylor, who tells me the *S. lacustre* is var. *ryckholtii*. Both are additions to the "Census" lists of Mollusca for the two counties. Half a dozen slugs from Mr. R. C. Haldane's garden at Lochend, Lerwick, Shetland, in May, have been forwarded to me by Mr. Harvie-Brown. Three of them are dark examples of *Limax maximus*, var. *fasciatus*, and the rest *Arion ater*. *L. maximus* is not in the authenticated "Census" list for Shetland, but it was recorded from there by Jeffreys many years ago.—WILLIAM EVANS, Edinburgh.

Chernes panzeri (*C. L. Koch*) in Forth.—When looking for pigeon ticks in Mr. Harvie-Brown's dovecot at Dunipace, East Stirlingshire, on 25th May 1911, I was pleased to find this False-Scorpion in considerable numbers. They were among the dirt and refuse at the bottom of the pigeons' nests. Mr. Wallis Kew, to whom specimens have been submitted, confirms my identification. *Chernes panzeri* is an addition to my list of the "False-Scorpions of the Forth Area," published about two years ago ("Proc. Roy. Phys. Soc." xvii. 40). In Mr. Godfrey's account of the "False-Scorpions of Scotland" ("Annals," 1908, p. 157) it is only recorded from the counties of Lanark, Peebles, and Ross—one locality in each.—WILLIAM EVANS, Edinburgh.

Northern Records of Diptera.—The following captures may be of interest to Dipterists, since little is known of the distribution of flies in the northern counties of Scotland, *Cephenomyia auribarbis*, Mg., one ♂ with red beard, red tail, pubescence on abdomen reddish, and thorax distinctly divided like *Hypoderma bovis*—Loch Assynt; *Hypoderma diana*, Brauer, one ♂, Loch Assynt; *Physoccephala nigra*, Deg., two ♂ ♂, Loch Assynt—a far north locality, though I took a single ♂ at Rannoch high up on the *Erebia cassiope* ground; *Gymnochæta viridis*, Fln., one ♂, Loch Assynt—another far northern locality; *Ptiolina atra*, Staeg., one ♂, Loch Assynt; *Porphyrops gravipes*, Wek., one ♂, Dingwall.—J. W. YERBURY.

BOTANICAL NOTES AND NEWS.

Pyrola uniflora, L., in the Outer Hebrides.—Dr. Williams, in the 8th part of his *Prodromus Fl. Brit.* (1911), p. 474, records that "2 specimens are in Smith's Herbarium, gathered about 1783 by Mr. James Hoggan in the island of Bernera." This is in the Sound of Harris, between Lewis and N. Uist. "One specimen is 8 cm., the other 10 cm., each having 5 leaves." This he records as its most northerly station; but it is found in E. Sutherland, farther north; in "Little Ferry Wood in Golspie," Mr. Doull, *sp.*, and Balbin Pine Wood, with Linnæa, Dr. Joass, *sp.*

This definitely makes the species an Outer Hebridean plant.—
A. BENNETT, 17, 3. 1911.

Valeriana dioica, L., in the Outer Hebrides.—Among some undetermined plants from the Isle of Scarp sent by Mr. J. S. Duncan in 1901, I find specimens (root leaves only) of this species.

It is recorded from W. Sutherland¹ by the Scottish Alpine Club, "near the foot of Beinn Laoghal."

Dr. R. Brown (Campster) recorded it for Caithness in a marked London Catalogue (ed. 6) to Mr. H. C. Watson.² It certainly occurs in Stirling (Kidston!). For Dumbarton, Mr. Watson was uncertain³ whether Balvie was correctly referred to that county; but it must mean a locality near Milngavie, and seemingly belongs to Dumbarton.

It does not seem to be recorded for Lapland or Finland; is very rare in Norway, and is recorded from Skåne, Halland, Bohuslän, Småland, and Öland in Sweden. It is not common in Denmark.

The figure in *English Botany*, t. 628 (ed. 3, t. 1548) does not give a good idea of the root-leaves, anyhow before the plant flowers; and I have had the root-leaves sent me several times asking what the plant was; and one correspondent, at least, was very sceptical as to my naming.

Beyond the above records it is named as occurring in vice-counties: 72, 73, 75, 77? and 79 to 86, all in Scotland.

It is sometimes divided in continental Floras into two or three; viz. :— β , *simplicifolia*, Rabath (*sp.*), and γ , *silvatica*, Schmidt (*sp.*), not L.—ARTHUR BENNETT.

Poa Chaixii, Vill., in Scotland. A new locality and a warning.—On the 23rd of May last I found this plant in great profusion covering a large area in the private grounds of Monteviot, Roxburghshire, quite close to the house. It has already been recorded for several places in the county, but not as far as I know for this locality.

Twice in the last two years this plant has been sent me for identification by parties who found it in an apparently natural habitat in Roslin Glen, Midlothian. Its presence in that locality is due to the mistaken zeal of a local botanical enthusiast who planted it there in 1903. Planting out of this kind leads to confusion, misunderstanding, and disappointment, and should not be practised.—JAMES FRASER.

Memorial to George Don at Forfar.—On 8th September 1910, a monument erected over the grave of George Don, in the form of a granite obelisk, was unveiled in the presence of a large

¹ "Trans. Bot. Soc. Edin." (1888), p. 374. ² "Journ. Bot." (1883), p. 343.

³ "Cyb. Brit." ii. (1849), p. 25.

gathering of townsfolk and visitors assembled to show respect to his memory. The monument is the gift of subscribers who recognised the value of Don's work for Scottish Botany. For many years his accuracy and trustworthiness were distrusted, and "Don's reputed discoveries" were notorious. But as the years have passed his discoveries have in many cases been confirmed. Unfortunately he gave ground in part to the distrust by refusal or unwillingness to make clear the localities of the rarer plants, causing them often to be sought for in vain; and in part by distributing, as wild, plants from his garden which he believed were sprung from plants brought from their native habitats in Scotland by himself, but were not so, but from garden plants that had grown among or replaced the wild plants. No one has done so much to establish Don's true claims to honour and respect from botanists as Mr. G. Claridge Druce, by whose own investigations the botany of Scotland has been so greatly advanced; and it was most suitable that he should have been chosen to unveil the monument, and to express the desire of the subscribers to honour G. Don. This he did in an eloquent address on the life and work of the man, on his rugged and sturdy character, his unwearied energy, his love of nature, his simple tastes, his extensive journeys in search of plants, and his numerous discoveries.

Much credit is due to Mr. John Knox for the successful carrying out of the scheme of placing a memorial in the town so long the home of G. Don.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—April-June 1911.

[The Editors desire assistance to enable them to make this Section as complete as possible. Contributions on the lines indicated will be most acceptable, and will bear the initials of the Contributor. The Editors will have access to the sources of information under mentioned.]

ZOOLOGY.

THE BEARDED SEAL IN SCOTLAND. J. G. Millais, *The Field*, April 22, 1911, p. 791. A young female shot by Mr. W. Berry at the mouth of the Beaulieu River, at the end of March 1911.

OSPREY IN RENFREWSHIRE. Thomas Malloch, *Zoologist*, June 1911, p. 237. A male bird found dead on 19th May in a glen in the north-west corner of the county.

BLACK TERN NEAR PAISLEY. C. S. B. R., *The Field*, April 29, 1911, p. 840. A single specimen observed 21st April.

NOTES ON THE BIRDS FREQUENTING ELDER PARK, GOVAN. William Rennie, *Trans. Nat. Hist. Soc. Glasgow*, vol. viii. (N.S.) pt. ii. (May 1911), pp. 209-218. Notes on 43 species.

AUTUMN AND WINTER BIRD-LIFE OF THE FAIRLIE SHORE. Robert W. S. Wilson, *Trans. Nat. Hist. Soc. Glasgow*, vol. viii. (N.S.) pt. ii. (May 1911), pp. 173-185. Notes on 115 species.

THE RETURN OF SUMMER BIRDS TO THE "CLYDE" AREA IN 1911. John Paterson, *The Glasgow Naturalist*, May 1911, pp. 92-5. Dates of arrivals given for 23 species.

GREAT SPOTTED WOODPECKER (*DENDROCOPUS MAJOR*) IN LANARKSHIRE. John Paterson, *The Glasgow Naturalist*, May 1911, p. 97.

BLACK TERN (*HYDROCHELIDON NIGRA*), TURTLE DOVE (*TURTUR COMMUNIS*), AND SCAUP DUCK (*FULIGULA MARILA*) IN RENFREWSHIRE. C. Stephen Bine Renshaw, *The Glasgow Naturalist*, May 1911, pp. 96-97.

RINGED PLOVER (*ÆGIALITIS HIATICOLA*) IN LANARKSHIRE. John Paterson, *The Glasgow Naturalist*, May 1911, p. 96.

NOTES ON RICHARDSON'S SKUA (*STERCORARIUS CREPIDATUS*, GM.). Robert W. S. Wilson, *Trans. Nat. Hist. Soc. Glasgow*, vol. viii. (N.S.) pt. ii. (May 1911), pp. 235-236. Principally devoted to observations made on the island of Yell, Shetland.

GLAUCOUS GULL (*LARUS GLACUS*) AND ICELAND GULL (*L. LEUCOPTERUS*) IN Ayrshire. John M'Crindle, *The Glasgow Naturalist*, May 1911, p. 96.

ADDITIONS TO "BRITISH CONCHOLOGY." J. T. Marshall, *Journ. Conchology*, July 1911, pp. 192-209. Many interesting Scottish records included.

SIX DAYS AT GLEN TILT, PERTHSHIRE. G. H. Conquest, *Entomologist*, April 1911, pp. 155-157. Twenty-five species of Lepidoptera recorded—obtained in July 1910.

NOTES ON *HEPIALUS HUMULI* AND ITS SHETLAND FORMS. Robert Adkin, F.E.S., *Proc. S. Lond. Ent. and Nat. Hist. Soc.* 1910-11, pp. 13-14.

MAMESTRA PERSICARIÆ IN SCOTLAND. (Capt.) H. Holmes-Tarn, *Entomologist*, June 1911, p. 225. Specimens taken on the Morayshire coast (20 miles from Craigellachie) in August 1910, and another seen.

TACHYPORINA, ETC. AT NETHY BRIDGE. T. Hudson Beare, *Ent. Mo. Mag.*, June 1911, pp. 139-140. Nineteen species recorded.

A NOTE ON *QUEDIUS ATTENUATUS*, GYLL., VAR. *PICIPENNIS*, HEER. Norman H. Joy, M.R.C.S., F.E.S., *Ent. Mo. Mag.*, June 1911, pp. 132-133. Records the insect from Garvie, Ross-shire, and Dalwhinnie, Inverness-shire.

EPIPEDA NIGRICANS: A CORRECTION. Norman H. Joy, *Ent. Mo. Mag.*, May 1911, p. 111. Records the species from Pitlochry.

A NOTE ON DR. SHARP'S NEW SPECIES OF *GABRIUS*. Norman H. Joy, M.R.C.S., F.E.S., *Ent. Mo. Mag.*, April 1911, pp. 80-82. In this paper *G. appendiculatus* is recorded from Blair-Atholl and Dalwhinnie.

CASSIDA NOBILIS, L., IN DUMBARTONSHIRE. William Evans, *Ent. Mo. Mag.*, April 1911, p. 90. Five specimens taken on the shore of Loch Long, near Peaton, Dumbartonshire, on 27th June 1910. Apparently new to Scotland. Identification confirmed by Dr. D. Sharp. See also *The Glasgow Naturalist*, May 1911, p. 96, where somewhat fuller details are given.

SOME HYMENOPTERA PARASITICA FROM THE HIGHLANDS. E. A. Elliott, *Ent. Mo. Mag.*, April 1911, p. 93. A list of forty-five species of Ichneumonidae taken between Banchory and Ballater in 1910.

THE DIPTERA OF CLYDE (Third List). R. Henderson, *Trans. Nat. Hist. Soc. Glasgow*, vol. viii. (N.S.) pt. ii. (May 1911), pp. 156-173.—A list of 323 species, of which 215 are new to the Clyde Area.

HILARA AERONETHA, MIK.: A DIPTERON NEW TO THE BRITISH LIST. A. E. J. Carter, *Ent. Mo. Mag.*, April 1911, pp. 83-84. A male taken at Comrie, Perthshire, 7th July 1907.

ADDITIONS AND CORRECTIONS TO THE BRITISH LIST OF MUSCIDÆ ACALYPTRATÆ. J. E. Collin, F.E.S., *Ent. Mo. Mag.*, June 1911, pp. 145-148. Numerous Scottish records are included in this useful paper.

SOME OBSERVATIONS ON THE DIPTEROUS FAMILY PHORIDÆ. J. R. Malloch, *Trans. Nat. Hist. Soc. Glasgow*, vol. viii. (N.S.) pt. ii. (May 1911), pp. 153-156.—Several Scottish records included.

NOTES ON BRITISH ORTHOPTERA IN 1910. W. J. Lucas, B.A., F.E.S., *Entomologist*, June 1911, pp. 208-211. The following Scottish records are given:—*Gomphocerus maculatus*: Linlithgowshire, 4th July (Brock); Lumphanan, 15th-31st July (Morton). *Omocestus viridulus*: Linlithgowshire, 29th June (Brock); Lumphanan, 15th-31st July (Morton). *Stauroderus bicolor*, Tynemouth, Haddingtonshire, 1st Oct. (Evans). *Chorthippus parallelus*: Lumphanan, 15th-31st July (Morton).



BRITISH ORTHOPTERA IN THE DALE COLLECTION. I. EARWIGS, COCKROACHES, AND CRICKETS. W. J. Lucas, B.A., F.E.S., *Ent. Mo. Mag.*, June 1911, pp. 135-138. *Forficula auricularia*, ♀, mentioned from N. Uist.

LIST OF PYCNOGONIDA COLLECTED IN THE CLYDE AREA. Richard Elmhirst, F.L.S., *Trans. Nat. Hist. Soc. Glasgow*, vol. viii. (N.S.), pt. ii. (May 1911), pp. 146-149.—Notes given on 11 species.

LABORATORY AQUARIUM NOTES. James S. Gemmill, M.A., M.D., D.Sc., *The Glasgow Naturalist*, May 1911, pp. 77-81.—Notes on *Leucodore (Polydora) ciliatus*, Johnston; *Ophryotrocha puerilis*, Clap. and Mets.; and *Amphitrite johnstoni*, Malmgren. All these are new records for the Clyde.

BOTANY.

FLOWERING PLANTS FOUND DURING EXCURSIONS OF GLASG. NAT. HIST. SOC. to Strathleven, Calder Glen near Lochwinnoch, Duncomb, Cambusnethan, and Inch Conaig near Loch Lomond. (*Glasgow Naturalist*, i. 1908, 140-144). Dimensions of trees are stated.

ON SOME ADDITIONS TO THE FLORA OF DUMBARTONSHIRE. By Laurence Watt (*Glasgow Naturalist*, i. 1908, 65-69). A number of species of flowering plants.

ON SOME FLOWERING PLANTS EXHIBITED by Laurence Watt, 29/3/10 (*Glasgow Naturalist*, ii. 80-82). Several species from Banff, one from Elgin, and several from Dumbartonshires; some are new records for the counties.

DALMALLY PLANTS, 1910. By Rev. E. S. Marshall (*Journ. Bot.*, 1911, 191-198). Some new vice-county records.

INTRODUCTIONS AT PAISLEY. (*Journ. Bot.*, 1911, 126-127, extracted from a paper in the *Selborne Magazine* for March 1911.) Forty species of casuals on rubbish on waste ground.

EXCURSIONS OF GLASGOW NAT. HIST. SOC. IN AUGUST 1909 (*Glasgow Naturalist*, ii. 27-30) to Perceton and to Kelburn Castle. Dimensions of various trees stated.

EXHIBITED AT MEETINGS OF GLASGOW NAT. HIST. SOC. (*Glasgow Naturalist*, ii.): *Corallorhiza innata* from Ardeer, Ayr (p. 25); 32 species of Hymenomycetes from Brodick (p. 25); *Calamintha Acinos* and *Carex pendula* from Islay (p. 96); *Lathyrus Aphaca* from banks of Clyde near Newton, Lanark (p. 96); *Mnium riparium* from Blantyre Priory, Lanark (p. 134); *Schislostega osmundacea* from Carron Glen, and *Vicia Orobus* from Stey Amry, New Cumnock, Ayr.

EROPHILA VIRESCENS, JORD., IN SCOTLAND. By E. S. Marshall (*Journ. Bot.* 1911, 198). From Whinnie Brae, Galashiels, in Selkirk, and near Melrose, Roxburgh.

NOTES ON LEPIDIUM. By C. E. Salmon (*Journ. Bot.* 1911, 163-164). "*L. heterophyllum* (DC.), Benth., var. *leiocarpum*, Thell., near Montrose, *Gardiner*, 1863. *L. neglectum*, Thell., Earlston, Wigton, *M'Andrew*, 1889."

ON THE SYCAMORES IN THE CLYDE DRAINAGE AREA. By John Renwick (*Glasgow Naturalist*, 1910, ii. 112-126). Careful measurements of many trees.

NOTES ON EPILOBIUM HYBRIDS. By R. H. Compton (*Journ. Bot.*, 1911, 158-163).

CHÆROPHYLLUM AUREUM, L., IN BRITAIN. By G. Claridge Druce (*Journ. Bot.* 1911, 117-118). In plenty by the Teith near Callander, detected by James Fraser.

ON THE BEECHES IN THE CLYDE DRAINAGE AREA. By John Renwick (*Glasgow Naturalist*, i. 1908, 75-92). Dimensions, ages, localities, etc., of many large trees.

NOTES ON ORCHIS ERICETORUM, LINTON, AND OTHER FLOWERING PLANTS. By Laurence Watt (*Glasgow Naturalist*, i. 1908, 93-96).

HABRODON NOTARISII, SCHPR. By D. A. Boyd (*Glasgow Naturalist*, 1910, ii. 144). At Kelburn Castle, Largs.

LIST OF ARRAN HEPATICÆ. By Symers M. Macvicar (*Glasgow Naturalist*, 1909, ii. 36-43). Ninety-nine species named, with localities.

FOSSOMERONIA DUMORTIERI (HÜB. AND GENTH.) IN DUMBARTONSHIRE. By Wm. Evans (*Glasgow Naturalist*, 1910, ii. 144).

MYCOLOGICAL NOTES. By D. A. Boyd (*Glasgow Naturalist*, 1910, ii. 92-96). Many microscopic species from living plants, etc.

A DAY ON THE LOWTHER HILLS. By D. A. Boyd (*Glasgow Naturalist*, i. 1908, 1-5). A number of microscopic fungi on plants in Upper Clydesdale.

WITH THE CRYPTOGAMIC SOCIETY OF SCOTLAND AND BRITISH MYCOLOGICAL SOCIETY AT DRUMNADROCHIT. By D. A. Boyd (*Glasgow Naturalist*, i. 1908, 33-35). A good many fungi noted.

MICROFUNGI FOUND AT HUNTERSTON, Ayrshire. By D. A. Boyd. (*Glasgow Naturalist*, i. 1908, 52.)

SOME RECENT ADDITIONS TO THE FUNGUS-FLORA OF THE CLYDE AREA. By D. A. Boyd (*Glasgow Naturalist*, i. 1908, 110-115). Numerous microscopic fungi.

MICROFUNGI FOUND AT ARDLAMONT (*Glasgow Naturalist*, i. 1908, 139), AND AT ARDGOWAN (*Id.* 140).

OCCURRENCE IN AYRSHIRE OF CHRYSOPHLYCTIS ENDOBIOTICA, SCHILL., THE FUNGUS OF BLACK-SCAB POTATO-DISEASE. By D. A. Boyd (*Glasgow Naturalist*, i. 62-65). At Saltcoats.

SOME RECENT ADDITIONS TO THE FRESH-WATER ALGÆ OF THE CLYDE AREA. By Robert Garry (*Glasgow Naturalist*, 1909, ii. 13-14). Eight species added.

BOOK NOTICE.

PHOTOGRAPHY FOR BIRD LOVERS: A PRACTICAL GUIDE. By Bentley Beetham, F.Z.S., with photographic plates. London: Witherby & Co. Price 5s.

The author of this little book is already favourably known in ornithological literature, and therefore former readers will welcome new work from his pen and camera. In the introductory chapter Mr. Bentley Beetham discusses from many points of view the work of the bird-photographer and indicates how a knowledge of field craft must be combined with a practical knowledge of photography before success can be hoped for. In chapter two the question of apparatus is thoroughly gone into, whilst in those following the photographing of different sorts of nests are described, and many practical hints are given as to the manipulation of the camera, etc. Throughout the whole book, which amounts to 122 pages, the author combines to give practical photographic instruction with ornithological lore in a pleasing and instructive fashion. He has much to say about exposure, signals, photography by concealment, etc., and at the same time he initiates us into the ways and habits of the Curlew, Lapwing, and many other birds. The chapter which deals with the photography of birds in flight is particularly interesting, whilst another chapter is devoted to bird photography in colour and in cinematography, two up-to-date aspects of this kind of the Science. As regards the illustrations, Mr. Bentley Beetham is to be congratulated on the fine series of photographs which clearly show his ability to act as mentor in "photography for bird lovers."

G. E. G.-M.



The Annals of Scottish Natural History

No. 80]

1911

[OCTOBER

TO OUR READERS.

WITH the present number the "Annals" completes its twentieth volume. Such an event presents a suitable opportunity for instituting such changes as the experience gained during the past seems to suggest. In the first place, Mr. Harvie-Brown, who, besides being an Editor, is the present proprietor of the magazine, feels that he should be relieved of certain of his responsibilities. Secondly, in the present age of specialisation it appears to be no longer desirable to combine the sciences of Zoology and Botany within the covers of one journal. And further, it is thought that a monthly issue instead of a quarterly would be likely to stimulate the interest of our readers and would lead to a more frequent and rapid publication of important information. The changes thus involved have been decided upon, and, commencing with the 1st January next, the journal will appear monthly under the title of "The Annals of Scottish Natural History (Zoology)."

The magazine has been acquired by Messrs. Oliver and Boyd, of Edinburgh (Messrs. Gurney and Jackson, London), and will in future be edited by Messrs. W. Eagle Clarke, William Evans, and Percy H. Grimshaw, with the assistance of Mr. J. A. Harvie-Brown, Misses E. V. Baxter and L. J. Rintoul, and Messrs. Hugh S. Gladstone, James Ritchie, and A. Landsborough Thomson.

The outlook of the "Annals," which has hitherto been exclusively Scottish, will be considerably broadened, since an important new feature will be a section devoted to notices of recent literature in the various branches of British Zoology, including records of new and rare species in all parts of the British Isles, observations on habits and life-histories, and other cognate subjects. This feature is intended to keep the reader in touch with the progress of zoological science in Britain generally.

The Editors desire it to be understood that, in spite of the changes indicated, the new "Annals" will be virtually a continuation of the old, and they trust that those who have kindly supported it in the past by subscriptions and literary contributions will continue to do so in the future.

All communications intended for publication, and all books, etc., for notice should be addressed to Percy H. Grimshaw, The Royal Scottish Museum, Edinburgh. Advertisements should be sent to the Publishers, Messrs. Oliver and Boyd, Tweeddale Court, Edinburgh.

Terms of Subscription: Six shillings per annum; post free, Six shillings and sixpence.

REPORT ON SCOTTISH ORNITHOLOGY IN 1910.

Compiled by LEONORA JEFFREY RINTOUL, H.M.B.O.U., and
EVELYN V. BAXTER, H.M.B.O.U.

(Continued from p. 149.)

MIGRATION.

January.—The first month of the year shows little migration, but after the 17th—about which time cold weather set in over Scotland—there was a certain amount of movement among the Turdinæ, Anatidæ, and Charadriidæ. Large flocks of Starlings passed over Aberdeen on the 21st in frost and snow, while by the 26th many Guillemots had returned to the Flannans. There are half-a-dozen records of Greenland Falcons during January.

February.—The weather during February was persistently unsettled, and frequently stormy; the winds were chiefly southerly or westerly, and the month generally was rough and boisterous. Throughout February Skylarks were on the move, and there are many records of flocks of Geese going north. On the 2nd a Dipper was seen at Barra (1.1910.183), and a large flock of Golden Plover arrived on North Ronaldshay; next day Shoveller appeared on Linlithgow Loch, while on the 4th hen Chaffinches were seen at Lerwick. Vast numbers of Red-throated Divers and a fair number of Gannets were present in Largo Bay on the 8th, while on the 10th Curlew arrived at North Ronaldshay, and the first Lesser Black-backed Gulls are noted at Dysart (Fife); by the 13th this species had reached North Ronaldshay, but it is not reported from the West Coast till 18th March at Kilmalcolm (2.ii.127). On the 14th Gannets arrived at North Ronaldshay, an Arctic Skua was seen in Largo Bay, and large flocks of Bar-tailed Godwits in Luce Bay. About this time Song-thrushes returned to Loch Awe, and Fulmars to the Flannans, while one of the latter species is reported from Tiree. On the 19th Lapwings arrived on the Pentland Skerries, and by next day this species had reached Fair Isle and the Butt of Lewis. On the 23rd a flock of about forty Tree-sparrows arrived on Fair Isle, while next day the first movement of Rooks is recorded from this locality, and small numbers kept on passing there till the end of the month. A flock of Cross-bills appeared at Lerwick on the 25th, and two flocks were noted in the same vicinity on the 27th, one of which was seen to arrive from a southerly and go off in an easterly direction (3.iii.373).

March.—This month shows more decided migration. There was an arrival of Stonechats between the 1st and 9th, and during March large movements of Lapwings are noted from many stations. Rooks, too, were on the move throughout the month, their passage being noted at Fair Isle, Lerwick, North Ronaldshay, and Sule Skerry, while many notes come of the migration of Golden Plover and Curlew. At Fair Isle on the 2nd a male Reed-bunting in almost full plumage, Greenfinches, and Skylarks are recorded, while

arrivals of Pied Wagtails are reported from this station, Alness (E. Ross), and Beattock. From the 6th to the 11th, with light southerly winds, there was a wide-spread movement of Redwings, Thrushes, Missel-thrushes, Blackbirds, Starlings, and Skylarks. Records come from Little Ross (Kirkcudbright) of a big passage of these birds on the nights of the 6th, 7th, and 8th, and the movement in a lesser degree was noted up to the 11th at North Unst, Sule Skerry, Whalsay Skerries, Pentland Skerries, the Flannans, and Montroseness. From the 13th to the end of the month the wind blew, almost without intermission, from W. and N. Snow-buntings in numbers are reported from the 13th to the 17th at Lerwick, Fair Isle, the Flannans, and Pentland Skerries. On the 20th a Yellow Wagtail was seen at Dalbeith (Clyde) (2.ii.127), the next recorded in this area being at Beith on 19th April. On the 24th Meadow-pipits arrived on the moors in Mull, on the 26th at Beattock, and by the 30th this species had reached the Flannans and Fair Isle. The northward passage of Whooper Swans in Orkney began on the 25th (1.1911.55), and on this day most of the Barnacle Geese left the Flannans, though a few lingered for a month or so longer. The first definite record of Wheatears comes from the Bell Rock, a male being got at the lantern there at 4 A.M. on the 26th; by next day this species is reported from the Flannans and Girvan, where, however, it had been "seen a day or two previously" (2.ii.127), and by the 30th it had reached a good many places on both East and West Coasts. On the 27th the first Ring-ouzel of the season is noted in South Perthshire, and next day a Chiff-chaff is reported as having been heard at Skelmorlie, Ayrshire (2.ii.127). A male White Wagtail is reported from Arthur's Seat on the 29th, the first West Coast records of this species being on the 31st at Cambuslang and Carmyle, both in Clyde (2.ii.127).

April.—With the advent of April a long spell of disturbed conditions set in, westerly and northerly winds predominated, and the temperature was generally below the normal, there being a marked absence of warm days. Constant migration is recorded during the month. During the whole of April, Redwings are recorded all over Scotland, passing north to

their breeding-haunts. Rushes are noted at the Flannans on the 2nd and 11th, at Sule Skerry on the 5th, and at Fair Isle on the 14th and 20th. Fieldfares, Thrushes, and Snow-buntings were also moving throughout the month, and Lapwings are noted at Fair Isle during this period. At this station Rooks were passing till the 8th, while on the 15th one was captured on the "Goldseeker" in the North Sea in $57^{\circ} 11' \text{ N.} \times 3^{\circ} 5' \text{ E.}$ Great Skuas began to arrive at their nesting-places on the 1st, while by the 3rd the first Swallows are recorded from Possil Marsh, Clyde (2.ii.128), by the 14th they are reported from several localities on both East and West Coasts. On the 4th the first Redstart of the season appeared on Fair Isle, and a Great Grey Shrike arrived at this station on the 6th. The first record of Sandwich Terns comes from Largo Bay on the 7th, this being unusually early; on the same day an early arrival of Whimbrel is noted at Tiree. Sand-martins are first recorded on the 9th at Duddingston and Dalmore (Ross), both on the East Coast, the first West Coast record being at Beith (Clyde) on the 14th (2.ii.128). Ring-ouzels are reported on the 10th from Dumfriesshire, on the 12th from Little Ross (Kirkcudbright), on the 15th from Mull, and from Clyde next day (2.ii.128); by the 24th they had reached Bressay (Shetland). On the 11th House-martins arrived at Lamlash (2.ii.128), and the 14th brings the first record of the Willow-warblers, one being killed at the Mull of Galloway Light; and Common Sandpipers arrived at Crosswood Reservoir (Forth) and Beith (Clyde, 2.ii.128). A Robin was caught on the "Goldseeker" in $57^{\circ} 18' \text{ N.} \times 3^{\circ} 43' \text{ E.}$ Cuckoos arrived in Dumfriesshire on the 15th ("Birds of Dumfriesshire," p. 173), and at Kilmaccolm (Clyde) on the 17th (2.ii.128). On the 16th two Wheatears, a Meadow-pipit, a Siskin, and a Goldcrest were caught on the "Goldseeker" in the North Sea, $57^{\circ} 5' \text{ N.} \times 0^{\circ} 5' \text{ E.}$, and the last Grey Plover was seen in the Dornoch Firth. The 19th shows an arrival of Willow-warblers, these being recorded from several places in Forth and one in Clyde (2.ii.128), and up to the end of the month the arrival of small numbers of these birds is noted in many Scottish localities. The first record of Common Terns comes from Little Ross on the 19th, and on the 22nd Tree-pipits arrived

in Mull. On the 22nd the first Corncrake was heard at Dalry (Clyde, 2.ii.128), and the first Whitethroat appeared at Corsemalzie (Solway) on the 24th; at this place, Tiree, and the Butt of Lewis, Golden Plover were on passage from the 24th to the 26th. Chiff-chaffs are noted at Dalry (Clyde) on the 25th (2.ii.127), and at Beith on the 30th, while the first mainland record of a Redstart comes from Kirkliston on the 29th.

May.—Early in May a low-pressure system advanced from the Arctic Sea, north of Ireland, down to North-Western Europe, the lowest barometric reading being recorded on the 6th. Immediately after this the barometer began to rise, and the filling-up process was completed by the 10th. From the 1st to the 9th the wind was generally of considerable force, and from some point between NW. and SW.; during this time the arrival of migrants in small numbers is recorded in Scotland. On the 2nd the first Swifts of the season are reported at Corsemalzie (Solway), Swallows in Tiree, and Goldeneye at Mull and Loch Leven. A White-fronted Goose is noted at Sule Skerry on the 3rd, and next day the first Whinchat of the season is recorded from Luce Bay (Solway), this species being seen at Beith (Clyde) two days later. There was an arrival of Whitethroats on the 5th and 6th on the East Coast and at Loch Awe, while from the 5th to the 8th White Wagtails on passage are noted from both East and West Coast stations. The first Black-cap of the year struck the lantern at Little Ross (Kirkcudbright) on the 5th, Yellow Wagtails were passing Kirkliston on the 6th, 13th, and 17th, and two were seen at Duddingston Loch on the 8th. At Kirkliston the main arrival of Sandmartins took place between the 6th and 17th. On the 8th the appearance of Sedge-warblers is recorded simultaneously from Corsemalzie (Solway), Beith (Clyde), and Duddingston (Forth). On the 9th the wind was E. and a good many birds arrived on Fair Isle, including the first Lesser Whitethroat of the season; next day many Greater Wheatears and White Wagtails arrived at this station, quantities of Pied Wagtails appeared at the Butt of Lewis, and the first Wood-warbler of the season at Beith (Clyde). On the 11th Curlew - sandpiper, many Turnstones, and some Golden

Plover were seen in Luce Bay, and next day the last Redwing of the season was noted at the Flannans. In Scotland, from the 11th to the 24th, the wind blew almost without exception from some point between NE. and SE., and an area of comparatively high pressure lay over our island. There was a marked variation from the normal conditions of pressure during this time, a low-pressure area to the SE. of us replacing the usual high. These weather conditions induced an enormous rush of migrants to our shores; the largest numbers were seen at Fair Isle, but a *great* deal of movement is recorded from the Flannans, North Unst, Pentland Skerries, North Ronaldshay, Sule Skerry, and Lerwick, while the migration was noted in a lesser degree at stations in Forth, Clyde, Argyll, and Solway. Wave upon wave of Ring-ouzels, Redstarts, Whitethroats, Willow-warblers, Spotted Flycatchers, Tree-pipits, Bramblings, and Red-buntings struck our shores, while smaller numbers of Fieldfares, Thrushes, Wheatears, Greater Wheatears, Whinchats, Arctic Bluethroats, Robins, Lesser Whitethroats, Black-caps, Garden-warblers, Wood-warblers, Chiff-chaffs, Hedge-accentors, House-martins, Swallows, Red-backed Shrikes, Pied Flycatchers, Meadow-pipits, White Wagtails, Siskins, Chaffinches, Wrynecks, Cuckoos, Kestrels, Lapwings, Corncrakes, and Whimbrel participated in the rush. By the 23rd this rush had begun to decrease, and by next day the great majority of migrants had left. Some records must be specially noted; on the 14th a Wheatear, Redstart, and Reed-bunting, all females, were caught on board the "Gold-seeker," 75 miles E. $\frac{3}{4}$ S. from Outskerry Light (Shetland), while next day a Long-eared Owl was seen on Fair Isle, and a Dotterel in Bute (2.ii.142). On the 16th a male Golden Oriole was found dead in West Fife (1.1910.182), and a Crossbill of the *Loxia curvirostra curvirostra* form was shot near Colinsburgh (E. Fife), and next day two Rock-thrushes appeared on the Pentland Skerries (1.1910.149). Near Largo (Fife) on the 19th flocks of hundreds of Greenfinches were seen, and a flock of about sixty "perhaps migrants" is recorded from Kirkliston, while a male Red-backed Shrike was seen near Pittenweem (E. Fife). A Lesser Whitethroat was seen at Rouken Glen (Lanark) on the 20th (1.1910.183),

and a passage of Sandpipers took place at Kirkliston on the nights of the 20th and 21st. The arrival of some of our common summer migrants was exceptionally protracted, the full number of Willow-warblers, Swallows, and House-martins not appearing at some of the East Coast stations till about 20th May. The last Bramblings of the season were seen on Fair Isle on the 21st, and a Grass-hopper Warbler was noted at Beith next day. About twelve Fieldfares and a Red-backed Shrike were seen on the Isle of May on the 23rd, and a male of the latter species is recorded at Balcomie (E. Fife), and also a Long-tailed Drake. After this, up to the end of the month, the wind was between NW. and SW., and not much migration is recorded. On the 26th four Brent Geese visited Fair Isle, and a flock of about a hundred Greenfinches was seen in Largo Bay, where was also a Sanderling. The last Fieldfare of the season was seen on Fair Isle on the 28th, while on the 31st a Dotterel is recorded from the Flannans.

June.—As might be expected, but little movement took place in June. During the first fortnight a few Swallows and House-martins were passing the Flannans, Butt of Lewis, Fair Isle, and Lerwick. A Night-jar is reported from Tranent on the 3rd, and on the 6th small flocks of Lapwings were seen at the Butt of Lewis. On the 8th and 9th a few migrants were present on Fair Isle, the species recorded including Ring-ouzel, Redstart, Robin, Whitethroat, Lesser Whitethroat, Willow-warbler, and Swift. Spotted and Pied Flycatchers were very late in appearing at Thornhill (Dumfries), not being seen till mid-June. On the 19th several hundred Scoter were seen in the sea off Aberdeen, mainly *Æ. nigra*. On the 25th an adult male Crossbill of the *Loxia curvirostra curvirostra* race arrived on Fair Isle (1.1910.245), and at this place a Long-tailed Duck was seen on the 28th, and three days later one is recorded from Lerwick.

July.—In Britain the first six days of July were very unsettled, from the 6th to the 19th the country was under the influence of an anticyclone, and after the 19th unsettled weather again became common to all districts. The return migration began early in July, becoming stronger later in the month. Golden Plover and Whimbrel were on the move,

and Common Sandpiper were passing down the East Coast after the 5th. An adult Scaup-drake was seen at Lerwick on the 4th. The autumn movement of Whinchats began at Largo on the 10th and at Kirkliston on the 13th, on which day Meadow-pipits also began to pass there. A female Crossbill of the *curvirostra curvirostra* type was found starved on St. Kilda on the 7th (1.1910.246), and a Crossbill arrived on the Bass on the 10th and stayed a week. In many places Cuckoos are noted as having left their summer quarters, while on the 14th a Great Skua was seen near the Isle of May. After the middle of the month Lapwings are recorded in some numbers from Fair Isle and North Ronaldshay, and by the 20th Wheatears were passing at the Flannans and Redstarts in East Fife. On this date an assembly of "hundreds if not thousands" of Swifts was seen near Corstorphine, and on the last two days of the month many were present at the Butt of Lewis. Small numbers of Herons were seen at Fair Isle and Barra Head. Bar-tailed Godwits are recorded from the Cromarty Firth on the 23rd, Largo Bay on the 24th, and Aberlady Bay on the 30th.

August.—The type of pressure distribution in August was of a very unstable character. The direction of the wind in Scotland varied greatly, while in Shetland there was a large proportion of breezes from the NE. Constant migration southwards is recorded, but only small numbers of birds at a time. Wheatears, Whinchats, and Cuckoos are recorded from many places as passing on migration, while during August the majority of Swifts left Scotland. Common Sandpipers, Green Sandpipers, and Greenshanks were also on the move. On the 1st, Sanderling returned to Largo Bay, Knots to Aberlady, and a Storm-petrel was found dead at North Berwick. Seven Crossbills were noted at Barra on the 3rd (1.1910.246), while by the 7th Willow-warblers were on return migration at Fair Isle. On the 8th three Sedge-warblers and a Willow-warbler struck the lantern at the Mull of Galloway, while nine Crossbills arrived on Fair Isle (1.1910.245); two which were procured proved to be *Loxia curvirostra curvirostra*. An immature Crossbill was procured at Torphins (Deeside) on the 9th

(1.1910.246), and on the Isle of May on the 11th were a Whitethroat, a Garden Warbler, quantities of Willow-warblers, a Sedge-warbler, an adult White Wagtail and a Ringed Plover. On the 14th a Two-barred Crossbill was procured on the Flannans, and a Ruff, a Reeve, and a Spotted Redshank were seen at Waulkmill Glen Dam (2.ii.142). Yellow Wagtails were passing Kirkliston on the 15th and 20th, and on the latter date a Lesser Whitethroat arrived on Fair Isle and two Hoodies on Whalsay Skerries. On the 22nd the Tree-pipit migration began at Largo, and "simply enormous flocks of Lapwings" were seen there, while the last Sedge-warbler is noted at Beith. On the 23rd in the middle of Fife, about the watershed between Forth and Tay, a large flock of Sandwich Terns flew over about 5 P.M. going south and calling as they flew. Next day the Crossbills left Fair Isle, where they had been in small numbers since the 8th. A flock of about fifty Pied, and at least one Yellow Wagtail was seen on the coast near Aberdeen on the 25th, and two days later three Spotted Redshanks were seen at Waulkmill Glen Dam (2.ii.142), and Great Northern Divers returned to Tiree. On this day and the 28th Sand-martins on passage are recorded from many places, sometimes in large numbers. The 29th brought some migrants to our shores, many Willow-warblers arrived on Fair Isle and some at North Unst, flocks of White Wagtails were passing south in Tiree, and Wigeon arrived in the Cromarty Firth and Luce Bay. A Spotted Redshank was seen at Donmouth on the 30th (1.1910.249), small numbers of a good many species appeared on Fair Isle, and a Goldcrest and a Wryneck struck the lantern at North Ronaldshay. On the last day of the month a Wryneck occurred on Fair Isle.

September.—With the advent of September the anticyclone which had occupied the middle region of the Atlantic expanded north-eastwards and embraced the entire area of the United Kingdom. Thenceforward for nearly four weeks an anticyclonic type was maintained over these islands. Frequently the area of high barometer readings was of enormous extent, stretching westwards right across the Atlantic to Newfoundland and beyond, and eastward

across the northern half of Europe. The winds were variable in direction, mainly from some westerly point in Scotland. A good deal of migration is recorded. Throughout the month Wheatears, Greater Wheatears, Meadow-pipits, White Wagtails, and Skylarks were on passage, while after the 11th movements of Song-thrushes took place. Though there was no great immigrations of Goldcrests, constant small arrivals are recorded during September and October at the lighthouse stations, most of those procured on the Isle of May being of the Continental race. On the 1st many Greenshanks occurred at Morton Loch (N. Fife), and about a dozen on Fair Isle; the first Snow-bunting returned to the Pentland Skerries, and that night and the next large bodies of Terns were passing over Lerwick. The last Common Sandpiper of the season was seen at Beith on the 3rd, on which day a good many Waders arrived on Fair Isle. Next day some Pied Flycatchers (1.1911.4) and a great many Rock-pipits appeared on the Isle of May. On the 5th the last Yellow Wagtail was seen at Beith, and about this time a Fulmar was caught at North Berwick. Hundreds of Swallows and a Sand-martin passed the Isle of May on the 6th (1.1911.4), and next day a Scarlet Grosbeak was got there (1.1911.4), three Black-tailed Godwits were seen in Tiree, and the last Swift of the season at Netherburn. On the 8th the last Garden-warbler is recorded at Kirkliston, a Sooty Shearwater was seen not far off Elie and one near Fidra next day (1.1911.114). Early on the 9th birds are reported at the lanterns of the Butt of Lewis, North Ronaldshay, the Mull of Galloway, and Isle of May; at the last station flocks of Common, Arctic, and Sandwich Terns (old and young) were passing south steadily all day, and three Crossbills arrived on Fair Isle. Grey Plover appeared in Aberlady Bay on the 10th, and an Arctic Bluethroat on the Isle of May (1.1911.2), where Lapwings began to call in the rays at 10.25 P.M. and flew round the lantern most of the night. At Kirkliston the autumn passage of Whinchats, which began on July 13th, finished on September 13th, and a Lesser Whitethroat (1.1911.3) and some Spotted Flycatchers arrived on the Isle of May. An arrival of Knots is recorded from the

Dornoch Firth, Aberdeen, and Loch Ryan on the 14th, and next day the first Glaucous Gull of the season appeared at Lerwick. During the latter half of the month Golden Plover were on the move in considerable numbers. On the 16th a Ruff is reported from Aberlady Bay and hundreds of Swallows were seen on the Isle of May (1.1911.4), while next night Storm-petrels and Manx Shearwaters were at the lantern on North Unst, several being caught. A great many Swallows had left Scotland by the 18th, and on this day the last Tree-pipit was seen on the Isle of May. On the 19th a Hoopoe was caught at Baltasound (Shetland) and three Crossbills are recorded from Fair Isle. A Fulmar is reported at North Berwick on the 20th, and next day a Blackcap appeared at Lerwick, the last Spotted Flycatcher of the season was seen at Aberdeen, and an Iceland Gull on North Unst. The 22nd shows many Pied Wagtails at Lahill (E. Fife) which had all passed on by afternoon, and the arrival of thirteen Mute Swans in Tiree. On the 24th another Hoopoe was noted at Baltasound, Pied Flycatchers on the Isle of May (1.1911.4), and the first Goldeneye of the season at Aberdeen. On the 25th the first arrival of Fieldfares is noted on the Isle of May (1.1911.2) and near Elie (E. Fife), and Bramblings appeared simultaneously at Tarbetness and the Isle of May (1.1911.4); at this last station were also arrivals of Blackbirds, Ring-ouzels, Rock-pipits, and Starlings. At night Terns were passing Barra Head and Montroseness. On the 26th Fieldfares are recorded at Cathkin (Clyde), and the first Redwings arrived at the Isle of May, as did a Missel-thrush, some Redstarts, the last Whinchat (1.1911.2) and Willow-warblers (1.1911.3); Whimbrel were heard passing over, and many of the Rock-pipits had left. The first Siskin and a Turtle-dove are noted on Fair Isle, while about 8 P.M. six Woodcock appeared on the Bell Rock: "one rested on the lantern for a few minutes, then the six flew off towards the land in a westerly direction." On the 27th Red-necked Phalaropes were passing North Ronaldshay, and some migrants arrived on the Pentland Skerries and Fair Isle. Early on the 28th Terns were passing over Aberdeen, and Grey Geese are reported from Barra Head, and next day from Aberlady Bay,

while on the 30th flocks of Geese were passing over Beattock and Crosswood Reservoir. Long-tailed Duck are reported on the 30th from Gott Bay (Tiree) and Tarbetness. During September a Crossbill was obtained at Ollaberry (Shetland), and an Osprey was seen on Tweedside on autumn migration.

October.—For the whole month the distribution of pressure differed widely from the normal. Instead of a gradual increase in the values from N. to S., the highest mean pressure was shown in an area having its central space on the east side of the North Sea and extending west across these islands. Pressure was low off the mouth of the English Channel and north-west of Iceland. There was a great deal of migration during October, increasing in intensity in the latter half of the month, when a large immigration of northern species took place. Throughout the month large numbers of Redwings were coming south, rushes are recorded on the 2nd and 11th, and a big one on the 15th. Missel-thrushes, Fieldfares, Song-thrushes, and Blackbirds were also on the move. From the 16th to the end of the month (wind mainly easterly) one continuous vast immigration of Turdinæ took place; the species affected were mainly Redwings and Fieldfares, but Missel-thrushes, Song-thrushes, and Blackbirds also occurred in considerable numbers. The stations recording this rush are: North Unst, Lerwick, Fair Isle, Sule Skerry, Pentland Skerries, Cape Wrath, Butt of Lewis, Flannans, Barra Head, Mull, Tiree, Skerryvore, Carmyle (Clyde), Cathkin, Glasgow, Beith, Tarbetness, Bell Rock, Isle of May, Bass, Largo, Kirkliston, Saltown, and Glenorchard. Up to the 16th (wind W. and N.) Wheatears and Greater Wheatears were constantly on the move, and many reports come of the arrival of Bramblings all from Orkney, Shetland, and the East Coast, with the exception of Mull whence they are recorded on the 13th. Siskins and Greenfinches arrived at many of our lighthouse stations during October, several Hoopoes were seen, and Golden Plover and Lapwing were on the move. On the 3rd Swallows arrived on the Isle of May from the East, a great Skua was seen there (1.1911.6), and one occurred near the Bell Rock. From the 3rd to the 5th there was a decided

immigration of Chaffinches at Lerwick, Fair Isle, the Pentland Skerries, and Isle of May, while a Lapp-bunting arrived at this last station on the 4th (1.1911.5). From the 6th to the 9th there were a good many Hedge-accentors on the Isle of May (1.1911.3), and at 6 A.M. on the 7th an Arctic Tern was caught at the lantern on Sule Skerry. About the 9th the first arrival of Mealy Redpolls is recorded from Ollaberry (Shetland), on the 10th Snow-buntings appeared at North Unst, the Flannans, and Butt of Lewis, and Snipe were arriving at Tiree. Next day many Chaffinches, Meadow-pipits, Snow-buntings, and the last Sand-martin of the year are recorded from Fair Isle, and Yellow-hammers appeared on the Isle of May; at this last station on the 14th two Mealy Redpolls (1.1911.4), a Short-eared Owl, and an adult Glaucous Gull put in an appearance, and the last House-martin was seen at Kirkliston. On the 15th Barnacle Geese arrived at the Flannans and Balgray Dam (2.iii.52), and a Continental Great Tit (1.1911.3), Wrens, Yellow-hammers (1.1911.4), and a Hoodie on the Isle of May. The last Redstart is recorded from Cairnryan, and a White Wagtail in winter plumage was shot on Tiree (1.1911.52). During the last half of October many arrivals of Robins are recorded from Lerwick, Fair Isle, Isle of May (one Continental sent), Pentland Skerries, Bell Rock, and Bass. On the 16th the wind was in the east, and many migrants arrived on the May; these included several Ring-ouzels, a Siberian Chiff-chaff (1.1911.3), a Wood-lark (1.1911.5), three Ortolan Buntings (1.1911.4), a Reed Bunting (1.1911.5), more Wrens, a Mealy Redpoll (1.1911.4), a Sooty Shearwater (1.1911.6), and a Little Grebe. Many Starlings were at the lantern in the early morning and again next morning. Mealy Redpolls arrived on Fair Isle, and about this time arrivals of Woodcock are noted from various places. On the 17th and 18th many Bramblings and some Wheatears, Swallows, Snow and Yellow Buntings, and Rooks arrived on Fair Isle. Mealy Redpolls appeared on North Unst, and a Black-cap (1.1911.3), Chaffinches, Hoodies, Jackdaws (1.1911.5), and Grey Geese on the Isle of May. Great Tits were seen on the sea-braes near Skateraw (Dunbar), and a Little Auk

in the sea near by (1.1911.114), while others are recorded in the Forth a few days later. Rooks are reported from Lerwick and North Ronaldshay on the 18th, and a little later they were on passage in various localities. Mealy Redpolls arrived on the Pentland Skerries on the 20th, and at Aberdeen and Mull (1.1911.114) next day; at the last locality they were accompanied by Lesser Redpolls and Twites. On the 21st the wind was due east, and remained E. and SE. till the 28th. On the 21st an immigration of Snow-buntings took place on Tiree and Fair Isle, and Slavonian and Red-necked Grebes are noted at Lerwick. Next day more Snow-buntings are recorded from Fair Isle, North Ronaldshay, and the Pentland Skerries, and the Mealy Redpolls received additions to their ranks, arrivals being recorded from North Unst, Largo, Bell Rock, Isle of May, Prestonpans, and Musselburgh ("Proc. Roy. Phys. Soc.," xviii. 198). Northern Bullfinches were procured on the Isle of May, and this species is recorded on Fair Isle in varying numbers from the 24th to the 30th. On the 23rd a Long-eared Owl was seen at Whalsay Skerries shore station, and from Lerwick and neighbourhood come notes of Northern Bullfinches, Bramblings, and a Red-backed Shrike. Many more Mealy Redpolls arrived, and with them some Lesser Redpolls and a Holboell's Redpoll, which was procured on the Isle of May (1.1911.4), and next day more Mealy Redpolls are recorded from Barnsness Lighthouse ("Proc. Roy. Phys. Soc.," xviii. 197), North Ronaldshay, and Crail. Many Snipe were seen at the Butt of Lewis on the 25th, a Great Tit on North Unst, and Mealy Redpolls at Cape Wrath, Saltoun, and Bolton. Two Northern Bullfinches were procured on the Isle of May on the 26th (1.1911.4), a Lanceolated Warbler was captured on the Pentland Skerries (1.1911.71), and a flock of Greenfinches arrived on Tiree. A small flock of Mealy Redpolls visited the Bass on the 27th, and Whooper Swans returned to Tiree; next day a large flock of *Acanthis linaria linaria* was seen near Carvenom (E. Fife), and two Holboell's Redpolls and a Siberian Chiff-chaff were procured at Seafeld, near Lerwick (1.1911.115). Woodcock arrived at Barra Head, Pentland Skerries, and the Bass, and next night at the Butt of Lewis.

On the 29th (variable wind) the last Greenland Wheatear of the season was procured at Lerwick, where a Blackcap is also recorded. A Holboell's Redpoll was procured on the sea-braes near Skateraw (1.1911.114), and a Northern Bullfinch at Archerfield (1.1911.113). On the 30th two Lapp-buntings were seen at Baltasound (Shetland), and Mealy Redpolls were caught at Possil Marsh (Clyde) (2.iii.35), while the last Swallows of the season were seen in East Fife. A note comes from Cairnsmore (Kirkcudbright) in October of a remarkable dearth of Snipe and great abundance of Stock-doves.

November.—During November the British Isles were almost always under the influence of low-pressure areas, generally of considerable depth, and as a whole the month was very windy and even stormy. The wind was mainly between W. and N. The movement of Turdinæ continued during the first week of November, though on a much smaller scale. Many arrivals of Siskins are recorded, while the immigration of Northern Bullfinches which began in October continued in November, these birds being noted at North Unst, Lerwick, Fair Isle (1.1911.54), and the Isle of May (1.1911.4). On the 2nd many Mealy Redpolls are reported from the Isle of May and the Bass, and on the 4th the last Wheatear of the season was seen at Tranent, and the last Corncrake on Barra. Next day a Black Redstart was seen at Scarnish (Tiree), and about this time some Holboell's and enormous flocks of Mealy Redpolls are noted in the Lothians ("Proc. Roy. Phys. Soc.," xviii. 198), and a good many Mealy and Lesser Redpolls near Beith (2.iii.34). On 7th November seven Lesser Black-backed Gulls were seen at the mouth of the Orchy, and two Mealy Redpolls were procured in Skye (3.iv.255), while on the 9th fresh arrivals of this species took place at Lerwick. A Great Grey Shrike was procured at the Tyne estuary near Dunbar on the 11th, while on the 12th more Redpolls arrived on the Pentland Skerries, and a Waxwing was observed near Edrom ("Berwickshire Field," Nov. 19). Next day an utterly exhausted Water-rail was picked up on South Ronaldshay. On the 13th and 14th (S. and E. wind) a small rush took place at the Bell Rock lantern, the species

recorded being Missel-thrush, Redwing, Fieldfare, Song-thrush, Blackbird, Rock-pipit, Skylark, and Starling. Most of these species and a fair-sized flock of Lapwings occurred on the Pentland Skerries on the 14th, and about sixty Lapwing along with other Wader at Fair Isle next day. On the 15th a Rough-legged Buzzard is reported from Luce Bay, and one was procured in Fife in "late autumn." The last Sandwich Tern was seen in Largo Bay on the 16th, on the 17th a Continental Great Tit appeared on Fair Isle (1.1911.53), and next day Bewick's Swans occurred at this station. On the 19th Mealy Redpolls were seen at Giffnock, and next day at Cathkin (Clyde) (2.iii.35), while on the 22nd they are recorded from Craignish (Argyll). On the 25th a Waxwing was caught near Tranent (1.1911.54), and on the 27th great flocks of Woodpigeons were seen passing south near the Bass, and the last Ring-ouzel of the season was seen at Fair Isle. At this station Mealy Redpolls were seen up to the 28th and Meadow-pipits up to the 30th. A Glossy Ibis was shot on South Unst in November ("Field," Dec. 10, 1910), and a Fulmar was found dead at North Berwick. During October and November the number of Mealy Redpolls in Scotland was phenomenal, notes of their abundance come from all down the East Coast from North Unst southwards, but the numbers seem to have been greater in "Forth" than in any other area. Smaller numbers are recorded from several places in the West of Scotland. This immigration extended to the very south of England.

December.—During December, the temperature on the whole was well above the average. Small numbers of Passeres are recorded as moving. Mealy Redpolls occurred at Skerryvore and the Pentland Skerries, and Siskins in various localities. Small numbers of Northern Bullfinches arrived at Lerwick, Rooks on Fair Isle and Whalsay Skerries, and Lapwings on North Ronaldshay. A Goldfinch is recorded at Tranent on the 11th, and a Hen-harrier at Scarfskerry (Caithness) on the 24th. Little Auks appeared at various places on the coast and a Fulmar at Aberdeen; at Barrahead about thirty of these birds arrived early on the 16th, and by the end of the month fifty or sixty were present

there. On the 20th a Teal-drake was shot at Glenorchard when fighting, which had been ringed on Isle Fanö, S.W. Denmark, on 19th October 1909.

We are indebted to the Weather Report of the Meteorological Office for the Meteorological data used in this Report.

CORRECTION.—Page 141, line 20. For “there is no previous note of this species in Orkney,” read “There is one previous note of this species in Orkney.”

THE AQUATIC COLEOPTERA OF THE NORTH EBUDES.

By FRANK BALFOUR-BROWNE, M.A. (OXON.), F.R.S.E., F.Z.S.

(Continued from p. 157.)

The total number of species taken during the few days in Skye was 43, such common species as *C. inaequalis* and *H. palustris* only occurring once each in a total of 24 collections. Although the list for Skye cannot be by any means exhaustive, I am inclined to think that my Eigg list is more nearly so, although it only contains 37 species, as I worked practically the whole island, and visited, I believe, all the different kinds of habitat there were. No doubt some species could still be added to the list, especially if a visit were made at some other time of year. For instance, such a northern species as *Caelambus 9-lineatus* might be expected to occur in Loch Beinn Tighe, which, by the way, produced absolutely nothing after about half-an-hour's search. Along one edge of the loch were many fine patches of moss growing in the water, but although I raked these in with the net and examined them carefully no Beetles appeared.

With regard to the elements comprising the fauna, I have already referred to the northern or arctic species at some length. The southern group is represented here, as in the Mid-Ebudes,¹ by *P. nigroæneus* and *D. lejolisii*, and, in addition, by *D. latus*. Except for these species, and the two

¹ *Loc. cit.* pp. 79, 80.

or three already referred to as being strictly northern in their distribution, the Water-beetle fauna is chiefly composed of species widely distributed in the British Islands.

But although the majority of Britannic Water-beetles are widely distributed, they are for the most part associated more or less closely with some particular kind of habitat, and in this association the elements of the fauna are merged together.

I have already mentioned that the only kind of ground worked in Skye was peat moss—excepting the Broadford River and one or two streams—while in Eigg, except in a small area close to Kildonnan, there were no collecting places which were not either peaty lochs or pools, excepting the streams. In both cases therefore the oxylophile associations dominate the fauna, as the following lists, giving the number of occurrences of every species taken in the two islands, show. I have given the figures as percentages in order that they may be compared in the two lists:—

SKYE.			EIGG.		
24 collections.	43 species.		33 collections.	37 species.	
		per cent.			per cent.
<i>H. pubescens</i> , <i>Gyll.</i>		62	<i>A. bipustulatus</i> , <i>L.</i>		75
<i>A. bipustulatus</i> , <i>L.</i> }			<i>H. pubescens</i> , <i>Gyll.</i> }		
<i>A. globulus</i> , <i>Payk.</i> }		50	<i>A. globulus</i> , <i>Payk.</i> }		54
<i>H. tristis</i> , <i>Payk.</i>			<i>H. obscurus</i> , <i>Sturm.</i>		48
<i>H. gyllenhalii</i> , <i>Schiöd.</i>			<i>Ph. melanocephalus</i> , <i>Ol.</i>		33
<i>H. obscurus</i> , <i>Sturm.</i>		37	<i>H. tristis</i> , <i>Payk.</i>		
<i>Ph. melanocephalus</i> , <i>Ol.</i>			<i>H. gyllenhalii</i> , <i>Schiöd.</i> }		30
<i>H. viridicollis</i> , <i>Steph.</i>		29	<i>H. viridicollis</i> , <i>Steph.</i>		27
<i>H. lineatocollis</i> , <i>Marsh.</i> }			<i>H. erythrocephalus</i> , <i>L.</i>		24
<i>G. natator</i> , <i>Scop.</i>		21	<i>A. arcticus</i> , <i>Payk.</i>		
<i>H. fulvus</i> , <i>F.</i>			<i>G. natator</i> , <i>Scop.</i>		21
<i>H. morio</i> , <i>Dej.</i>			<i>L. truncatellus</i> , <i>Thunb.</i> }		
<i>H. erythrocephalus</i> , <i>L.</i>			<i>H. nigrita</i> , <i>F.</i>		
<i>A. sulcatus</i> , <i>L.</i>		12	<i>Rh. bistriatus</i> , <i>Forst.</i> }		18
<i>Ph. minutus</i> , <i>F.</i>			<i>D. griseostriatus</i> , <i>De G.</i>		15
<i>H. brevipalpis</i> , <i>Bedel.</i>			<i>H. lineatocollis</i> , <i>Marsh.</i> }		
¹ <i>H. ruficollis</i> , <i>Brit. Authors</i> }		8	<i>A. sturmii</i> , <i>Gyll.</i>		12
<i>H. rivalis</i> , <i>Gyll.</i>			<i>A. sulcatus</i> , <i>L.</i>		

¹ The recent paper by Edwards (EMM. January 1911) points out that several species have been included under the name of "ruficollis." I have not kept my specimens and therefore cannot say to which species they belonged.

SKYE (*continued*).EIGG (*continued*).

	per cent.		per cent.
H. nigrita, <i>F.</i>	8	D. lapponicus, <i>Gyll.</i>	9
A. congener, <i>Payk.</i>		H. brevipalpis, <i>Bedel.</i>	
A. arcticus, <i>Payk.</i>		H. rivalis, <i>Gyll.</i>	
Rh. exoletus, <i>Forst.</i>		H. morio, <i>Dej.</i>	6
G. minutus, <i>F.</i>		I. fuliginosus, <i>F.</i>	
H. picicrus, <i>Thoms.</i>		D. punctulatus, <i>F.</i>	
L. minutus, <i>L.</i>		D. assimilis, <i>Payk.</i>	3
L. truncatellus, <i>Thunb.</i>	4	H. celatus, <i>Clark.</i>	
H. confinis, <i>Steph.</i>		H. melanarius, <i>Sturm.</i>	
C. inæqualis, <i>F.</i>		H. discretus, <i>Fairm.</i>	
D. latus, <i>Steph.</i>		H. lituratus, <i>F.</i>	
D. assimilis, <i>Payk.</i>		I. ænescens, <i>Thoms.</i>	
¹ D. elegans, <i>Panz.</i>		G. minutus, <i>F.</i>	
D. 12-pustulatus, <i>Ol.</i>		H. fuscipes, <i>L.</i>	
D. griseostriatus, <i>De G.</i>		H. picicrus, <i>Thoms.</i>	
H. lepidus, <i>Ol.</i>		Ph. minutus, <i>F.</i>	
H. palustris, <i>L.</i>		P. nigroæneus, <i>Sahlb.</i>	
H. incognitus, <i>Sharp.</i>		A. limbata, <i>F.</i>	
A. chalconotus, <i>Panz.</i>		C. orbiculare, <i>F.</i>	
P. maculatus, <i>L.</i>			
I. ænescens, <i>Thoms.</i>			
D. punctulatus, <i>F.</i>			
D. lapponicus, <i>Gyll.</i>			
G. opacus, <i>Sahlb.</i>			
H. aquaticus, <i>L.</i>			

O. lejolisii, *Rey* and *Muls.*
only occurred in brackish water-
pools on the rocks, and I have
not counted this or *L. Tighe* in
the above 33 collections.

Now although all the species high in these two lists are oxylophiles (or species such as *A. bipustulatus* which are equally at home as halophiles, helophiles, etc.), some of those far down are also undoubtedly oxylophiles, and their lowness is, of course, due to their rarity. It is not easy to account for the rarity of some of these species, as for example:—*A. congener*, *A. chalconotus*, *I. ænescens*. Some, such as *P. nigroæneus*, are evidently at the northern limit of their range, while in the case of certain others some remarks may be of interest.

The oxylophile group is not a simple association—

¹ Through correspondence and exchange of specimens with M. Sainte Claire Deville I find that all my Britannic specimens recorded as *D. depressus*, *F.*, are in reality *D. elegans*, *Panz.* *D. depressus* is an arctic species and may occur in Scotland or the North of Ireland, but I expect that all the specimens in our collections under this name are Panzer's species. It is surprising that such a mistake should ever have got into our catalogues.

adopting the definition of this term used by the æcological botanists—but contains at least two associations, one characteristic of the bog-pool habitat, the other of the lochs of the peat moors. Species belonging to one of these associations will often be found associated with species of the other association, since the two habitats obviously merge in places. For instance, there are few highland lochs without at least some *Sphagnum* patches round their margins, and these patches will usually contain some of the pool species; also it is difficult to decide between a large pool and a small lochan. Even so it is probable that some species are more restricted to actual pools than others. For instance, *H. gyllenhalii* seldom occurs in lochs, while *H. obscurus* is much less particular. If we compare the associates of the *H. gyllenhalii* with those of a species such as *D. griseostriatus*, which, in our district, only occurred in the lochs, this point is clearly seen:—

Associates of *H. gyllenhalii*.

SKYE and EIGG.

19 collections. 31 species.

per cent.

<i>H. pubescens</i>	. . . 100
<i>A. bipustulatus</i>	. . . 95
<i>A. globulus</i>	. . . 79
<i>H. tristis</i>	. . . 74
<i>Ph. melanocephalus</i>	. . . 68
<i>H. obscurus</i>	. . . 63
<i>H. viridicollis</i>	. . . 47
<i>H. erythrocephalus</i>	} . . . 21
<i>H. nigrita</i>	
<i>H. morio</i>	
<i>G. natator</i>	} . . . 16
<i>L. truncatellus</i>	
<i>H. brevipalpis</i>	
<i>A. sturmii</i>	} . . . 11
<i>I. fuliginosus</i>	
<i>Rh. bistriatus</i>	
<i>Ph. minutus</i>	} . . . 5
<i>H. lineatocollis</i>	
<i>D. assimilis</i>	
<i>D. griseostriatus</i>	

Associates of *D. griseostriatus*.

SKYE and EIGG.

6 collections. 22 species.

per cent.

<i>A. arcticus</i>	. . . 100
<i>H. obscurus</i>	} . . . 83
<i>A. bipustulatus</i>	
<i>H. erythrocephalus</i>	} . . . 68
<i>D. lapponicus</i>	
<i>A. sulcatus</i>	
<i>G. natator</i>	} . . . 50
<i>L. truncatellus</i>	
<i>H. tristis</i>	
<i>Rh. bistriatus</i>	} . . . 33
<i>D. punctulatus</i>	
<i>Ph. melanocephalus</i>	
<i>A. globulus</i>	} . . . 17
<i>H. fulvus</i>	
<i>D. assimilis</i>	
<i>H. gyllenhalii</i>	} . . . 17
<i>H. pubescens</i>	
<i>A. sturmii</i>	
<i>I. ænescens</i>	
<i>Rh. exoletus</i>	

Associates of *H. gyllenhalii*
(continued).

SKYE and EIGG.

per cent.

<i>H. incognitus</i>	}	5
<i>A. arcticus</i>		
<i>I. ænescens</i>		
<i>D. punctulatus</i>		
<i>D. lapponicus</i>		
<i>G. sulcatus</i>		
<i>G. minutus</i>		
<i>H. picicrus</i>		
<i>P. nigroæneus</i>		
<i>A. limbata</i>		
<i>H. aquaticus</i>		

Associates of *D. griseostriatus*
(continued).

SKYE and EIGG.

per cent.

<i>G. minutus</i>	}	17
<i>H. viridicollis</i>		

From these lists it is seen that *H. obscurus* and *A. bipustulatus* are practically indifferent as regards loch or pool habitat, while others such as *H. pubescens* and *tristis*, *A. globulus*, etc., *A. arcticus*, *A. sulcatus*, etc., are almost confined to the one or the other. The composition of either association will vary in different parts of the country, new species coming in and others disappearing, and as showing the subtle influence of climatic factors in giving advantage to one species in one place and another in another place, the cases of *Hydroporus morio* and *Agabus arcticus* are very good illustrations. The former is undoubtedly a member of the pool association, and so far as I know occurs nowhere as a loch species. The scarcity of this species in Eigg and in Skye, so far as my collecting went, was probably due to insufficient elevation. The height above sea-level, at which the species becomes common, no doubt varies considerably in different localities, but is, I think, usually somewhere near the 1000 ft. contour in the southern part of Scotland.

I have already pointed out that it replaces *H. gyllenhalii* at the higher elevations. An interesting case of this change occurred in Arran, where I was collecting in June 1906. On Goatfell, climbing by way of Brodick Castle, one comes to a more or less extensive peat moss at about 1000 ft. elevation. Here I collected in a number of pools, and *H. gyllenhalii* was common; it was in fact the dominant

species. *H. morio* occurred in many of the pools, but always in small numbers. A little farther on at 1200 ft. is another extensive "plateau" with numerous pools, and here *H. morio* was common, while, after much work, I could only find a single specimen of *H. gyllenhalii*. In Skye and Eigg this latter species was not dominant, as it only occurred in 37 and 30 per cent respectively of the collections, but *H. morio*, owing to the absence of higher ground, was not there to take its place.

The case of *A. arcticus* is interesting as being an example of a species truly "limno-oxylophile" in this district, whereas it is not so restricted in many other localities. I found it commonly in July 1905 on Rannoch Moor (Perth Mid) at about 950 ft. in the peaty pools, and also at Aviemore (Easternness) in June and July 1904 it occurred in many of the pools at elevations of 1600 ft. and over. Apparently the explanation of this fickleness is that below a certain elevation—varying, of course, in different localities—the species is excluded from the pool association, and only in the higher and colder places can it force its way into that group. The same remarks also apply to *Deronectes griseostriatus*, which at high elevations invades pools as well as lochs.

What I have said here concerning the associations of Water-beetles is deduced from somewhat meagre and incomplete material, but it seems to me that what is being done by the æcological botanists is equally capable of being done by zoologists, especially in groups where statistical results can be accumulated. I hope later to deal with the subject of the associations of the Aquatic Coleoptera more fully.

The only helophile (Fresh-water marsh) habitat which I found on Eigg was a few small grassy pools below Kildonnan and just on the edge of the rocks at the shore. Here, *H. discretus*, *H. fuscipes*, *H. brevipalpis*, and *C. orbiculare* occurred. A single specimen of *H. lituratus* occurred at the same place, and was the sole representative of the halophile (Salt marsh) group, for which there seemed to be no suitable ground.

The interesting question as to whether these few pools at Kildonnan hold the remnants of a once extensive helophile fauna, or whether they represent the first foothold of species which have recently invaded the island, cannot be

answered as the result of one visit to the island. Only long experience with the various species and with the successive changes, both in the plant formations and in the corresponding Water-beetle associations, can satisfactorily settle such a point. Hence the use of such lists of species as I have given lies largely in the future, when a re-examination of the ground will indicate changes in the fauna, which may help to explain the origin of island faunas, and to solve the question whether land-connections are of such importance as some authors have declared.

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1855. " (2) 'Notes on Certain British Hydrocantharidæ,' *ibid.* p. 4770.
- " (3) 'Synonymic List of the British Carnivorous Water-Beetles, together with Critical Remarks and Notices of Foreign Allied Species,' *ibid.* p. 4850. (These two papers merely refer to the 1854 record.)
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1869. " 'D. lapponicus in Ireland,' *ibid.* v. 141.
1870. White, F. Buchanan. 'Notes on the Habits of *D. lapponicus*, Gyll.," "Scot. Naturalist," vi. (He mentions that Somerville also took the species "in an island near Mull.")
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1898. Thornley, Rev. A. 'Additional Coleoptera from the Summit of Ben Nevis.' (Collected by Mr. W. S. Bruce in May 1896.) "Ann. Scott. Nat. Hist." vii. 30. [*D. lapponicus* in tarn about 2500 feet.]
1903. Beare, T. Hudson. '*D. lapponicus* in Tobermory district, Mull, MS. Note of Captures in August 1903 kindly sent me.

The complete list of "Britannic" records for *D. lapponicus* up to the present time seems to be as follows:—

"Clyde district" (uncertain).	Inverness, E. (Strathglass).
Ebudes Mid (Mull).	„ W. (Ben Nevis).
„ North (Rhum, Skye,	Donegal (probably West!?).
Eigg).	

CONTRIBUTION TO OUR KNOWLEDGE OF THE HYDROID FAUNA OF THE WEST OF SCOT- LAND.

BEING AN ACCOUNT OF COLLECTIONS MADE
BY SIR JOHN MURRAY, K.C.B., ON S.Y. "MEDUSA."

By JAMES RITCHIE, M.A., B.Sc.,
The Royal Scottish Museum.

(Continued from p. 164.)

54. THUIARIA LONCHITIS (Ell. and Sol.) (= *Thuiaria articulata* of Hincks's "History").

Kirchenpauer, in 1884, endeavoured to unravel the confusion which had gathered round the *Thuiaria articulata* of authors, a designation which included two distinct species, the *Sertularia articulata* of Pallas and the *Thuiaria articulata* of Fleming, the latter of which had been earlier designated *Thuiaria lonchitis* by Ellis and Solander. Comparison of the Cape of Good Hope species with that found in British waters leaves no doubt as to their specific distinctness, although so recently as 1900 Pictet and Bedot considered them specifically identical, and there can be almost as little doubt that the Cape species, with opposite pinnæ springing from the middle of the internodes, is the original *T. articulata* of Pallas. After examination of a large number of specimens, including those in the British Museum and in the collections made by the Scottish North Sea Investigation Committee, I am convinced that *T. articulata*, Pallas, does not occur in British waters, and that that name may therefore be safely deleted from British lists and replaced by *Thuiaria lonchitis* (Ellis and Solander).

CLYDE SEA AREA.—KYLES OF BUTE—off Tighnabruaich. ARRAN BASIN—Kilbrennan Sound, 20 fms. (M.). BARRIER PLATEAU—Achinhoan Head and Davarr Is., sand, 17-20 fms.; Sanda to Achinhoan, 19-22 fms., m.c.; Sound of Sanda, 22 fms.; between Sanda Is. and Ailsa Craig, 24 fms.

SANDA IS., 35 fms.



55. THUIARIA TENERA (G. O. Sars).

As *T. tenera* has never been recorded in Britain, I give a short diagnosis of the species for the guidance of British workers. This is the more necessary, as I feel certain that the species is not a very uncommon one in our waters, and that, in all probability, its general likeness to young colonies of *Thuiaria argentea* has caused it to be overlooked or erroneously assigned to that species.

Trophosome.—The colonies attain a height of between two and three inches, and are characterised by the delicacy and fineness of their build. The stems are unfascicled and straight, but zigzag almost imperceptibly between the branchlets towards the summit. They are divided into long regular internodes, each with three hydrothecæ, two on one side and one placed intermediate to these on the other side. From beneath the lower of the pair a branch arises, the branches being alternate, usually simple, and lying in one plane. The branches are divided into long internodes which generally bear three pairs of hydrothecæ. The hydrothecæ are subalternate, but they vary much in the details of shape (*see* Broch, 'Die Hydroiden der arktischen Meere,' in "Fauna Arctica," 1909, p. 172, fig. 27). They are always slender, flask-shaped below, the upper portion, which juts out from the internode more or less abruptly, tapering to the orifice. Nutting ("American Hydroids," part ii., 1904, p. 70) describes the margin as "sometimes being round and without teeth, and sometimes being curved, with two teeth of regular Sertularian type. In many cases the margin is produced into a thin collapsible tube. Operculum usually composed of one flap attached to abcauline side of margin, but sometimes composed of two flaps." While the hydrothecæ in some of the colonies I have examined agree with Nutting's description in having tubular terminations and single-valved opercula, these seem to me to be secondary features apparent where the original margin of the hydrotheca has become obscured by the regeneration of successive new margins, each new margin retaining the stamp of its predecessor less and less clearly. Even in such cases the primary hydrotheca of the series shows two lateral lobes, and indications of two valves in the operculum, the abcauline being much larger and more perfectly formed.

Several abnormalities occur. In one a branch has been replaced by an elongate oval hydrotheca which, but for its base, is altogether free and projects in line with the existing portion of the branch. In another, there occur abnormally long cylindrical hydrothecæ similar to those I have described and figured in *Sertularella quadridens* ("Proc. Zool. Soc.," 1910, p. 819, fig. 79). Again a branch bifurcates into and terminates in two gonangia (fig. 5), while many gonangia on one colony are abnormally attenuated and are marked by deep annular constrictions (fig. 4).

Gonosome.—The gonangia vary much in size, but their outline is fairly constant, except in such abnormal cases as are figured below. They are elongate, ovate, with an insignificant stalk, a round aperture, and a short collar surrounded by translucent points of chitin. They arise immediately proximal to a hydrotheca and occur in close rows, a single hydrotheca being sometimes accompanied by two gonangia (fig. 2).

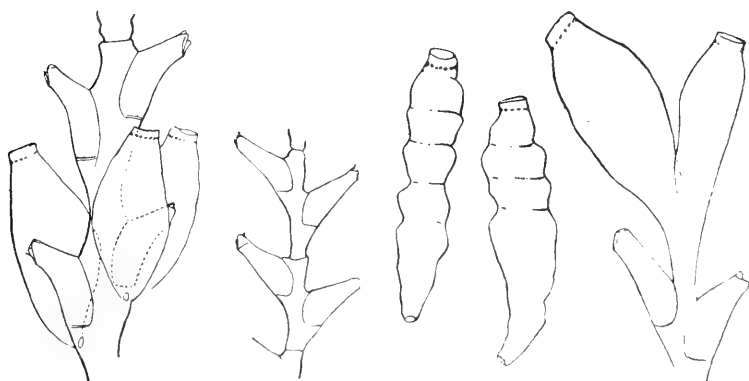


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

FIGS. 2-5. *THULARIA TENERA*. $\times 30$.

- Fig. 2. Fragment of branch from Tighnabruaich, with hydrothecæ and gonangia.
 „ 3. „ „ „ Mull of Cantyre, with hydrothecæ.
 „ 4. Abnormal annularly constricted gonangia, Tighnabruaich.
 „ 5. Abnormal branch terminating in two gonangia.

The following measurements give some idea of the variable proportions of the species :—

	Specimens from Tighnabruaich.	Specimens from Cantyre.
Hydrotheca, length free . . .	0.21-0.29 mm.	0.17-0.29 mm.
Hydrotheca, length adnate . .	0.25-0.28 mm.	0.14-0.15 mm.
Hydrotheca, greatest diameter .	0.14-0.17 mm.	0.12-0.18 mm.
Hydrotheca, diameter at mouth .	0.08-0.10 mm.	0.06 mm.
Gonangium, length . . .	0.81-1.33 mm.	
Gonangium, greatest diameter .	0.31-0.44 mm.	

Localities.—CLYDE SEA AREA.—KYLES OF BUTE—off Burnt Islands ; off Tighnabruaich (specimens in Rothesay Museum and in my collection).

MULL OF CANTYRE, 50 fms., growing on *Halecium muricatum* ; small fragment.

Although this species is not to be found in British lists, specimens in the Natural History Museum, Vienna, have been recorded

by Marktanner-Turneretscher as from a Scottish locality, "Great Cumbray."¹ Broch, too, has found specimens at the depth of 68 metres, in latitude 56° 50' N., long. 1° 36' W., sufficiently near the coast of Kincardineshire to be regarded as British.²

Thuiaria tenera is a boreal species confined apparently to the North Pacific, the North Atlantic, and the Arctic Oceans.

56. THUIARIA THUJA (Linn.).

CLYDE SEA AREA.—BARRIER PLATEAU—Loch Ryan (M.).

57. SERTULARIA PUMILA (Linn.).

CLYDE SEA AREA (M.).—GARELOCH—shore; head to Stroul, 10-15 fms., m.c.; E. side above Narrows, 14 fms. LOCH GOIL—shore, low water, c. DUNOON BASIN, 20-40 fms.; E. and W. sides, shore. LOCH STRIVEN—shore, m.c. UPPER LOCH FYNE—shore, c. ARRAN BASIN—Kilbrennan Sound, Kildalloig Bay; Davarr Is., 15 fms., sand, m.r.

58. SERTULARELLA FUSIFORMIS (Hincks).

CLYDE SEA AREA (M.).—UPPER LOCH FYNE—E. side, 15 fms., r.r. ARRAN BASIN—off Pladda, 30-35 fms., r.r.

59. SERTULARELLA GAYI (Lamouroux).

CLYDE SEA AREA.—DUNOON BASIN—E. side, 16-20 fms., r.r. (M.). ARRAN BASIN (M.).—Kilbrennan Sound; off Davarr Is., 20 fms., r.r.; Otterard to Carradale, 18-20 fms., r.; centre, off Saddell, 47 fms., r. BARRIER PLATEAU—between Sanda Is. and Ailsa Craig, 24 fms. MULL OF CANTYRE, 49 fms. FIRTH OF LORNE, 50-70 fms. LOCH BUI, 9-15 fms.

60. SERTULARELLA POLYZONIAS (Linn.).

CLYDE SEA AREA.—DUNOON BASIN—centre, 10-15 fms. (M.). ARRAN BASIN—Kilbrennan Sound, Kildalloig Bay, Davarr Is., 15 fms., m.r. (M.). BARRIER PLATEAU—Sound of Sanda, 22 fms., on *Thuiaria lonchitis*.

MULL OF CANTYRE, 49 fms., on *Thecocarpus myriophyllum*.

FIRTH OF LORNE, 56 fms., on *Eudendrium ramosum*.

¹ G. Marktanner-Turneretscher, 'Die Hydroiden des k.k. naturhistorischen Hofmuseums' in "Ann. naturh. Hofmus. Wien," vol. v., 1890, p. 231.

² Hj. Broch, "Nordsee Hydroiden von dem norwegischen Fischereidampfer 'Michael Sars' in den Jahren 1903-1904 gesammelt," Bergens Mus. Aarbog, 1905, No. 6, p. 20.

61. SERTULARELLA RUGOSA (Linn.).

CLYDE SEA AREA.—UPPER LOCH FYNE—Minard Narrows, 12-20 fms., r. (M.). ARRAN BASIN—off Pladda, 30-35 fms., r. (M.).
BARRIER PLATEAU—between Sanda Is. and Ailsa Craig, 24 fms.

62. SERTULARELLA TAMARISCA (Linn.) (= *Diphasia tamarisca* of Hincks's "History").

CLYDE SEA AREA (M.).—BARRIER PLATEAU—between Achinloan Head and Davarr Is., 17-20 fms., sand, on *Thuiaria lonchitis* (M.); Sound of Sanda, 22 fms., on *Thuiaria lonchitis*.
FIRTH OF LORNE, 30-50 fms., on *Antennularia antennina*; 70-80 fms., c. on *Diphasia pinaster* and *Tubularia indivisa*.

63. SERTULARELLA TENELLA (Alder).

CLYDE SEA AREA.—BARRIER PLATEAU—between Achinloan Head and Davarr Is., 17-20 fms., sand, on *Thuiaria lonchitis* (M.); Sound of Sanda, 22 fms., r. on *Thuiaria lonchitis*.
FIRTH OF LORNE, 30-50 fms., on *Antennularia antennina*; 70-80 fms., c. on *Diphasia pinaster* and *Tubularia indivisa*.

64. HYDRALLMANIA FALCATA (Linn.).

CLYDE SEA AREA (M.).—GARELOCH—E. side above Narrows, 10-15 fms.; centre, above Narrows, mud, 20-30 fms.; Shandon to Narrows, 15 fms., mud and hard ground; above buoy, at Narrows, 15-12 fms., m.r.; Narrows, 3-5 fms., c. DUNOON BASIN, 20-40 fms.; E. side, 5-42 fms., r. ARRAN BASIN—Kilbrennan Sound, in line with Davarr Is. and Brown Head, Arran, 27-30 fms., r.; Otterard to Carradale, 18 fms., r.; centre, off Saddell, 47 fms., r. BARRIER PLATEAU—Sanda to Achinloan, 22 fms., r. (M.); between Sanda Is. and Ailsa Craig, 24 fms.

MULL OF CANTYRE, 50 fms.

LOCH ETIVE, 70 fms.

FIRTH OF LORNE, 30-50 fms., 70-80 fms.

LOCH CARRON—above Stromeferry, 50-60 fms., mud.

Family PLUMULARIDÆ.

65. ANTENNULARIA ANTENNINA (Linn.).

CLYDE SEA AREA (M.).—DUNOON BASIN, 20-40 fms.; E. and W. sides, 10-20 fms. ARRAN BASIN—Kilbrennan Sound, below Isle of Ross, 12-14 fms., r.r.; Cumbrae Is., off Tan Buoy, 7 fms.; 3 miles N. of Pladda Light, 17-20 fms., c., also 27-30 fms. (M.).

FIRTH OF LORNE—three records between 30 and 110 fms.

66. ANTENNULARIA RAMOSA, Lamarck.

CLYDE SEA AREA.—DUNOON BASIN (M.), 20-40 fms.; E. side, 8-42 fms., r.; centre, 18-20 fms., r.; W. side, 8 fms., r.; Skelmorlie Bell Buoy, 7-15 fms. ARRAN BASIN (M.)—Kilbrennan Sound; Otterard to Carradale, 18-20 fms., r. BARRIER PLATEAU—3 miles N. of Pladda Light, 17-20 fms., m.c. (M.); between Achinloan Head and Davarr Is., 17-20 fms. (M.); Sanda to Achinloan, 19-22 fms., c. (M.); between Sanda Is. and Ailsa Craig, 24 fms.

MULL OF CANTYRE, 49 fms.; 64 fms.

FIRTH OF LORNE, 30-50 fms.

67. PLUMULARIA CATHARINA, Johnston.

CLYDE SEA AREA.—DUNOON BASIN, 20-40 fms. (M.); off Cloch Lighthouse, 16-30 fms. (M.). ARRAN BASIN—Kilbrennan Sound (M.); off Pladda, 30-35 fms., r. (M.). BARRIER PLATEAU—between Sanda Is. and Ailsa Craig, 24 fms., r. on *Antennularia ramosa* and *Halecium beanii*; Ailsa Craig, 24 fms.

MULL OF CANTYRE, 49 fms., on *Halecium halecinum*; 64 fms.

FIRTH OF LORNE, 10-30 fms., on *Diphasia pinaster*; 30-50 fms., c. on *Antennularia ramosa* and *Diphasia pinaster*; 60-80 fms., on *Diphasia pinaster*; 30-110 fms., on *Aglaophenia tubulifera*; 50-110 fms., on *Schizotricha frutescens*.

68. PLUMULARIA PINNATA (Linn.).

CLYDE SEA AREA.—LOCH GOIL (M.), 10-15 fms., r.; outside Barrier, 10-12 fms., r. DUNOON BASIN (M.)—E. side, 16-20 fms., r.r.; centre, 10-15 fms. BARRIER PLATEAU—Sanda to Achinloan, 22 fms., r. (M.); between Sanda Is. and Ailsa Craig, 24 fms.

MULL OF CANTYRE, 49 fms.

69. PLUMULARIA SETACEA (Ellis).

CLYDE SEA AREA.—GARELOCH—across Barrier, 5-21 fms. (M.).

FIRTH OF LORNE, 30-50 fms., on *Antennularia ramosa*.

70. PLUMULARIA SIMILIS, Hincks.

CLYDE SEA AREA.—DUNOON BASIN, 20-40 fms. (M.).

POLYPLUMARIA, G. O. Sars.

As a description of this genus may not be available to local collectors, I give the following definition:—

Trophosome.—Colony with compound stems and branches, the latter being arranged in pinnate fashion. Hydroclades (ultimate hydrotheca-bearing branchlets) often bearing on the lowest internode a simple or branched secondary hydroclade more slender than themselves. Each hydrotheca is accompanied by a single pair of definitely placed lateral sarcothecæ which are not fixed immovably to it. Margin of hydrotheca smooth.

Gonosome.—Gonangia sac-shaped, springing from branches or from hydrocladia, at the origin of the latter.

The only British species is—

71. POLYPLUMARIA FLABELLATA, G. O. Sars.
(= *P. pumila*, Allman).

Trophosome.—Colony attaining a height of 10 cms., composed of fascicled stems, and fascicled branches which arise from the stem in opposite pairs, and themselves bear opposite branches. All of these lie in one plane and are furnished with alternate hydroclades arranged in no definite number on the internodes of an anterior cladate tube. The hydroclades are only from 1 to 3 mm. long, are set on a long process furnished with sarcothecæ, and are divided into internodes, on each of which, except sometimes the basal, a hydrotheca is borne. The proximal hydrothecate internode of a hydroclade gives rise to a simple or branched hydroclade, the first internode of which bears only a series of nematophores. The hydrothecæ are cylindrical, widening slightly towards the mouth, unattached to the internode, except at the rounded base. They are accompanied by three definitely placed trumpet-shaped sarcothecæ, one proximal, placed medianly a little below the hydrotheca, and two flanking the hydrotheca near its margin. In addition there are generally present one, two, or three smaller sarcothecæ, lying in the median line of the internode above the hydrotheca.

Gonosome.—The gonangia, which were not observed on the Scottish specimens, arise on the branches near the base of a primary hydroclade. They are ovate, with obliquely truncated summit, a short neck surrounded by a whorl of nematophores, and a short peduncle.

Localities.—CLYDE SEA AREA.—BARRIER PLATEAU—fragment of a colony from between Sanda Island and Ailsa Craig, 24 fms.

FIRTH OF LORNE, 50-110 fms. A single complete colony, which, although it is only 64 mm. high, less than half the size of those collected by the "Travailleur" and "Talisman," shows no lack of robustness in its finer structures, for measurements of the trophosome agree in every detail with those of specimens from the Bay of Biscay and the Azores recorded by Dr. A.

Billard.¹ One of the accessory tubes projecting beyond the cladate tube had developed a stolon-like extremity, and several of the hydroclades also terminated in similar prolongations.

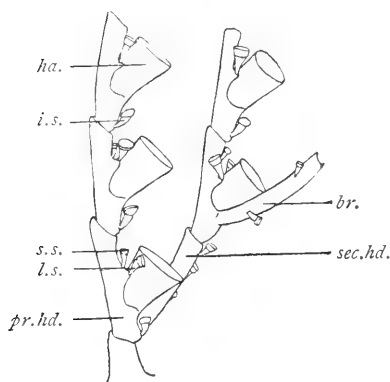


FIG. 6. *POLYPLUMARIA FLABELLATA*.
× 40.

Portion of hydroclade of *Polyplumaria flabellata*. *br.*, branch of secondary hydroclade; *ha.*, hydrotheca; *i.s.*, inferior median unpaired sarcotheca; *l.s.*, paired lateral sarcotheca; *pr.hd.*, primary hydroclade; *s.s.*, supracaly-cine unpaired sarcotheca; *sec.hd.*, secondary hydroclade.

Distribution.—The species appears to be widely distributed in the neighbourhood of the Azores (Allman, 1883, as *P. pumila*; Pictet and Bedot, 1900; Billard, 1907) and in the Bay of Biscay, off the N.W. corner of Spain. At the time when I identified these specimens in the British Museum, *P. flabellata* had not been recorded from British Seas. Since then, however, the occurrence of a specimen in the collection of the Swedish State Museum has been recorded by Dr. Jäderholm from the "Shetland Islands, 'Jutska Refvet,' some sterile colonies growing on *Diphasia alata*. Collector unknown."²

While I cannot but agree with Pictet and Bedot that no specific distinction exists between Allman's *P. pumila* and the form recorded above, more evidence is required ere *Diplopteron insigne* (Allman, 1874) of the "Porcupine" Expedition can be definitely linked with it. For the opposite hydrocladial nematophores, upon whose occasional occurrence in *P. flabellata* Bedot lays stress, are indefinite in their position on the hydroclade and even in their relation to one another, and on this account are of altogether different value as a distinguishing character from those definitely placed, strictly opposite nematophores which may be regarded rather as supplementary appendages of the lateral nematophores than as independent structures arising directly from the hydroclade. Nutting, indeed, regards them, provisionally at least, as of generic significance (1900, p. 81).

¹ A. Billard, "Expéditions scientifiques du 'Travailleur' et du 'Talisman,'" 'Hydroides,' vol. viii., 1907, p. 222.

² E. Jäderholm, 'Hydroiden, in Northern and Arctic Invertebrates in the Collection of the Swedish State Museum,' "Kungl. Svenska Vetens.-Akad. Handl." vol. xlv., 1909, p. 109.

I have been unable to find 'Jutska Refvet' on the one inch Ordnance Survey Maps of the Shetland Islands.

72. *AGLAOPHENIA PLUMA* (Linn.).

CLYDE SEA AREA.—DUNOON BASIN—E. side, 8-42 fms., m.c. (M.).
FIRTH OF LORNE, 50-110 fms. (M.).

73. *AGLAOPHENIA TUBULIFERA* (Hincks).

CLYDE SEA AREA (M.).—DUNOON BASIN—E. side, 16-20 fms., m.c.; centre, 20 fms., r. ARRAN BASIN—Kilbrennan Sound, Otterard to Carradale, 15-20 fms., r.

MULL OF CANTYRE, 64 fms., many colonies.

FIRTH OF LORNE—three records between 30 and 110 fms., with corbulæ, c.

THECOCARPUS, Nutting.

From the genus *Aglaophenia* there have been separated and placed in *Thecocarpus* such species as possess a hydrotheca at the base of each leaflet of the phylactocarp, or corbula, in which the reproductive bodies are protected. Such species are also to be distinguished by the insignificance of the lateral teeth of the hydrothecal margin.

74. *THECOCARPUS MYRIOPHYLLUM* (Linn.)

(= *Aglaophenia myriophyllum* of Hincks's "History").

CLYDE SEA AREA.—DUNOON BASIN (M.), 20-40 fms.; Warden Bank, 8 fms. KYLES OF BUTE, off Tighnabruaich. ARRAN BASIN (M.).—Kilbrennan Sound, 10-15 fms.; below Isle of Ross, 12-14 fms.; Kildalloig Bay, Davarr Is., 15 fms.; Davarr Is. to Brown Head, Arran, 17-30 fms. BARRIER PLATEAU—Ailsa Craig, 24 fms.

SANDA IS., 4 miles S.E., 30-35 fms. (M.).

MULL OF CANTYRE, 49 fms.

FIRTH OF LORNE, 10-30 fms.; 60-70 fms.

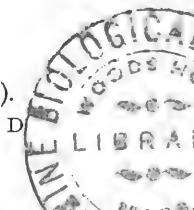
HALICORNARIA, Busk.

Halicornaria is distinguished from *Aglaophenia* by the arrangement of the gonangia, which are entirely unprotected by any special developments of the hydroclades. According to Nutting, further distinguishing marks of the genus occur in the trophosome, the chief of these being the presence of an anterior intrathecal ridge, and the absence of septal ridges in the internodes.

75. *HALICORNARIA PENNATULA* (Ell. and Sol.)

(= *Aglaophenia pennatula* of Hincks's "History").

CLYDE SEA AREA.—ARRAN BASIN—Kilbrennan Sound (M.).



A CONTRIBUTION TO OUR KNOWLEDGE OF THE FRESHWATER RHIZOPODA AND HELIOZOA OF SCOTLAND.

By JAMES MEIKLE BROWN, B.Sc., F.L.S.

COMPARATIVELY little systematic work appears to have been done on the distribution of the Freshwater Rhizopoda and Heliozoa of Scotland. Penard and Murray published in 1905 a report on material collected by the Lake Survey from Loch Ness; G. S. West, also in 1905, gave lists of species found chiefly in plankton collections from the Orkney, Shetland, and other outlying islands; while Murray again in 1907 and W. Evans in 1909 published lists of species from the Forth Area. Beyond these papers, and scattered references in Cash's monograph, no published results seem to be available.

It was with a view to commencing a more detailed investigation that material was collected by the writer during August and September of last year, from various localities in Scotland; and it was hoped that some species hitherto unrecorded for this country might be found. This hope has been justified by the results, and it is probable that further work will yield still more interesting finds; but it will require much more extended observations before the problems dealing with the general distribution of these interesting animals can be solved. Further, it will be only after a very careful study of the variations occurring amongst the "species"—and many seem to have a rather wide range of variability—that the limits of, and relationship between, the different species can be definitely decided. At present it is often very difficult or even impossible, especially in some genera, to discriminate between species, unless the individuals are quite "typical." This is particularly the case amongst the Euglyphæ, many small forms occurring which at present defy the systematist.

As it will probably be some time before further collections in other localities can be made, it has been thought desirable to publish the results so far obtained.

For the purpose of recording the results the material collected may be divided into—A. Gatherings of sphagnum and other bog-mosses; and B. Gatherings of drier mosses from woods, rocks, and walls. This division is convenient, for it is found that while many species of Rhizopod inhabit “moss” indifferently, whether wood-moss or bog-moss, some species are restricted to sphagnum, while others again are characteristic of the drier mosses growing on rocks and walls, or on the ground in woods, and these latter are generally less well-known than the others.

The following gatherings were made:—

A. BOG-MOSSES (SPHAGNUM, ETC.).

1. From Craiggaffie (near Stranraer), Wigtownshire.
2. „ Genoch Moor (near Stranraer), Wigtownshire.
3. „ Dindinnie Moor (Rhinn of Galloway), Wigtownshire.
4. „ Carsphairn, Kirkcudbrightshire.
5. „ Drumboy Hill, Ayrshire.
6. „ Colintrave, Argyleshire.
7. „ Aberfoyle, Perthshire.
8. „ between Aberfoyle and the Trossachs, Perthshire.
9. „ Trossachs Pass, Perthshire.
10. „ the slopes of Ben Ledi, Perthshire.
11. „ Glen Shee, Perthshire.
12. „ near the summit of the Cairnwell, Aberdeenshire.
13. „ near Ballater, Aberdeenshire.

B. MOSSES (OTHER THAN BOG-MOSSES).

1. From near Portpatrick, Wigtownshire.
2. „ walls near Kirkcudbright, Kirkcudbrightshire.
3. „ walls near Gatehouse-of-Fleet, Kirkcudbrightshire.
4. „ the ground in Glen App, Ayrshire.
5. „ the ground in Trossachs Pass, Perthshire.
6. „ rocks in Glen Devon, Perthshire.
7. „ rocks in Glen Eagles, Perthshire.
8. „ the ground in Pinewoods, Blairgowrie, Perthshire.
9. „ the ground near Aboyne, Aberdeenshire.
10. „ walls near Kincardine O’Neil, Aberdeenshire.

The collections, as will be seen from the tabulated summaries, varied greatly in richness, both in point of number of species and of individuals. The richest gatherings came from Craiggaffie and Ben Ledi.

TABLE I.—SPHAGNUM GATHERINGS.

LIST OF SPECIES.	Craigcaffie.	Genoch Moor.	Dindinnie Moor.	Carsphairn.	Drumboy Hill.	Colintraive.	Aberfoyle.	Between Aberfoyle and Trossachs.	Trossachs Pass.	Ben Ledi.	Glen Shee.	Cairnwell.	Ballater.
	1	2	3	4	5	6	7	8	9	10	11	12	13
AMOEBA.													
<i>Amoeba limax</i> , <i>Dujardin</i> .		×			×						×		
<i>vespertilio</i> , <i>Penard</i> .			×		×								
<i>limicola</i> , <i>Rhumbler</i> .							×						
<i>Dactylosphaerium radiosum</i> (<i>Ehrenb.</i>), <i>Bütschli</i> .	×	×		×			×						×
<i>Vampyrella lateritia</i> (<i>Fresen.</i>), <i>Leidy</i> .													×
ARCELLINA.													
<i>Pseudochlamys patella</i> , <i>Clap.</i> <i>et Lach.</i> .				×						×			
<i>Arcella vulgaris</i> , <i>Ehrenb.</i> .	×	×	×										×
<i>discoides</i> , <i>Ehrenb.</i> .	×												
<i>catinus</i> , <i>Penard</i> .			×							×	×	×	×
<i>Centropyxis aculeata</i> (<i>Ehrenb.</i>), <i>Stein</i> .	×		×					×		×	×		×
<i>Centropyxis aculeata</i> , <i>var.</i> <i>ecornis</i> (<i>Ehrenb.</i>), <i>Leidy</i> .											×		
<i>Centropyxis levigata</i> , <i>Penard</i>											×		
DIFFLUGINA.													
<i>Diffugia oblonga</i> , <i>Ehrenb.</i> .	×	×		×	×		×	×		×	×		
<i>bacillifera</i> , <i>Penard</i> .	×			×									
<i>rubescens</i> , <i>Penard</i> .	×		×	×									
<i>fallax</i> , <i>Penard</i> .				×				×					
<i>bacilliarum</i> , <i>Perty</i>											×		
<i>globulus</i> , <i>Ehrenb.</i> .				×			×			×			
<i>constricta</i> (<i>Ehrenb.</i>), <i>Leidy</i> .	×	×		×	×	×	×	×		×		×	×
<i>Pontigulasia vas</i> (<i>Leidy</i>), <i>Schout</i> <i>compressa</i> (<i>Carter</i>), <i>Cash</i> .				×									×
<i>Lesquereusia spiralis</i> (<i>Ehrenb.</i>), <i>Bütschli</i> .													×
<i>Cryptodiffugia oviformis</i> , <i>Penard</i>	×	×		×	×		×	×		×	×		
NEBELINA.													
<i>Hyalosphenia papilio</i> , <i>Leidy</i> .	×							×		×	×	×	
<i>elegans</i> , <i>Leidy</i> .								×		×			
<i>Nebela collaris</i> (<i>Ehrenb.</i>), <i>Leidy</i> .	×			×	×	×	×	×	×	×	×	×	×
<i>Nebela tincta</i> (<i>Leidy</i>), <i>Awerintz</i> <i>bohémica</i> , <i>Taranek</i> .	×	×	×	×		×	×	×	×	×	×	×	
<i>longicollis</i> , <i>Penard</i> .					×						×		
<i>tubulosa</i> , <i>Penard</i> .	×	×	×	×	×		×				×		×
<i>flabellulum</i> , <i>Leidy</i> .	×		×	×			×	×		×			

TABLE I.—*Continued.*

LIST OF SPECIES.	Craigcaille.	Genoch Moor.	Dindinnie Moor.	Carsplairn.	Drumboy Hill.	Colintraive.	Aberfoyle.	Between Aberfoyle and Trossachs.	Trossachs Pass.	Ben Ledi.	Glen Shee.	Cairnwell.	Ballater.
	1	2	3	4	5	6	7	8	9	10	11	12	13
<i>Nebela carinata</i> (Archer), <i>Leidy</i>	x						x			x			
marginata, <i>Penard</i>	x									x			
militaris, <i>Penard</i>	x	x	x	x			x	x		x		x	
tubulata, <i>Brown</i>	x						x		x	x			
dentistoma, <i>Penard</i>	x	x	x	x	x	x	x	x		x	x	x	x
vitrea, <i>Penard</i>										x			
<i>Quadrula symmetrica</i> (Wallich), <i>Schulze</i>					x					x		x	x
<i>Heleopera petricola</i> , <i>Leidy</i>	x	x	x	x	x		x	x	x	x			x
rosea, <i>Penard</i>	x		x	x		x	x	x			x	x	
EUGLYPHINA.													
<i>Pamphagus granulatus</i> , <i>Penard</i>											x		
<i>Euglypha alveolata</i> , <i>Dujardin</i>	x	x			x								
ciliata (Ehrenb.), <i>Leidy</i>		x	x		x						x		
strigosa (Ehrenb.), <i>Leidy</i>	x	x	x	x		x	x			x	x		x
compressa, <i>Carter</i>	x	x					x	x					x
filifera, <i>Penard</i>		x	x			x				x	x		x
cristata, <i>Leidy</i>	x	x				x	x			x	x		x
laevis, <i>Perty</i>	x	x		x	x					x	x	x	
<i>Placocysta spinosa</i> , <i>Leidy</i>	x		x				x	x		x	x	x	
jurassica, <i>Penard</i>	x												
<i>Assulina seminulum</i> , <i>Leidy</i>	x		x				x	x	x	x	x	x	
muscorum, <i>Greeff</i>	x	x	x							x	x	x	
<i>Cyphoderia ampulla</i> (Ehrenb.), <i>Leidy</i>				x	x	x				x			x
<i>Sphenoderia lenta</i> (Ehrenb.), <i>Leidy</i>	x	x				x	x			x			x
<i>Sphenoderia fissirostris</i> , <i>Penard</i>	x		x	x	x		x	x		x	x	x	
macrolepis, <i>Leidy</i>	x												
dentata, <i>Penard</i>	x			x	x								
<i>Trinema enchelys</i> (Ehrenb.), <i>Leidy</i>	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Trinema lineare</i> , <i>Penard</i>		x										x	
complanatum, <i>Penard</i>	x			x	x		x	x			x		x
<i>Corythion dubium</i> , <i>Tavanék</i>	x	x	x	x	x	x	x	x	x		x		
pulchellum, <i>Penard</i>	x				x		x			x			
AMPHISTOMINA.													
<i>Ditrema flava</i> , <i>Archer</i>	x		x	x				x	x	x		x	x
<i>Amphitrema stenostoma</i> , <i>Niisslin</i>	x		x	x			x			x		x	x
<i>Amphitrema Wrightianum</i> , <i>Archer</i>	x		x							x			

TABLE II.—DRIER MOSS GATHERINGS.

LIST OF SPECIES.	Near Port Patrick.	Kirkcudbright.	Gatthouse-of-Fleet.	Glen App.	Trossachs.	Glen Devon.	Glen Eagles.	Blairgowrie.	Aboyne.	Kincardine O'Neil.
	1	2	3	4	5	6	7	8	9	10
AMŒBINA.										
<i>Amœba verrucosa</i> , <i>Ehrenb.</i> . . .	×		×	×			×			
<i>limax</i> , <i>Dujardin</i>						×				
<i>Diplophrys timida</i> , <i>Penard</i> . . .	×									
ARCELLINA.										
<i>Arcella discoides</i> , <i>Ehrenb.</i> . . .	×									
<i>arenaria</i> , <i>Greeff</i>		×	×	×					×	×
<i>Centropyxis aculeata</i> (<i>Ehrenb.</i>), <i>Stein</i>	×					×				
<i>Centropyxis levigata</i> , <i>Penard</i> . .	×									
DIFFLUGINA.										
<i>Diffugia oblonga</i> , <i>Ehrenb.</i> . . .	×			×		×				
<i>fallax</i> , <i>Penard</i>				×					×	
<i>lucida</i> , <i>Penard</i>	×		×	×						×
<i>globulus</i> , <i>Ehrenb.</i>	×								×	
<i>constricta</i> (<i>Ehrenb.</i>), <i>Leidy</i> .	×	×	×	×		×	×		×	×
<i>arcula</i> , <i>Leidy</i>								×		
<i>Pontigulasia spiralis</i> , <i>Rhumbler</i> .	×									
<i>Cryptodiffugia oviformis</i> , <i>Penard</i> .	×				×		×	×	×	×
<i>Phryganella hemispharica</i> , <i>Penard</i> .		×	×		×			×	×	×
NEBELINA.										
<i>Nebela collaris</i> (<i>Ehrenb.</i>), <i>Leidy</i> .	×									
<i>tincta</i> (<i>Leidy</i>), <i>Awerintz</i> . .					×			×	×	
<i>militaris</i> , <i>Penard</i>					×			×		×
<i>lageniformis</i> , <i>Penard</i> . . .	×						×			
<i>bigibbosa</i> , <i>Penard</i>						×				
<i>dentistoma</i> , <i>Penard</i>	×			×		×			×	
<i>Quadrula symmetrica</i> (<i>Wallich</i>), <i>Schulze</i>				×						
<i>Quadrula irregularis</i> , <i>Archer</i> . .						×				
<i>Heleopera sylvatica</i> , <i>Penard</i> . .			×			×	×		×	
<i>petricola</i> , <i>Leidy</i>	×					×				×
EUGLYPHINA.										
<i>Euglypha alveolata</i> , <i>Dujardin</i> . . .	×		×	×		×		×		
<i>ciliata</i> (<i>Ehrenb.</i>), <i>Leidy</i> . .	×				×	×	×			
<i>strigosa</i> (<i>Ehrenb.</i>), <i>Leidy</i> . .		×			×		×	×	×	
<i>levis</i> , <i>Perty</i>	×	×		×			×			×
<i>Assulina seminulum</i> , <i>Leidy</i> . . .					×			×		
<i>muscorum</i> , <i>Greeff</i>	×	×			×		×		×	×
<i>Cyphoderia ampulla</i> (<i>Ehrenb.</i>), <i>Leidy</i>	×			×						
<i>Sphenoderia lenta</i> , <i>Leidy</i>				×						
<i>dentata</i> , <i>Penard</i>	×			×		×			×	×
<i>Trinema enchelys</i> (<i>Ehrenb.</i>), <i>Leidy</i>	×	×		×	×	×	×	×	×	×
<i>Trinema lineare</i> , <i>Penard</i>		×		×					×	
<i>complanatum</i> , <i>Penard</i>					×		×	×	×	
<i>Corythion dubium</i> , <i>Taranek</i> . . .		×	×	×	×		×	×	×	×
<i>pulchellum</i> , <i>Penard</i>				×						

In addition to the above, two new species were obtained, viz. *Nebela scotica* from Ben Ledi, a form apparently related to *N. dentistoma*, and *Euglypha bryophila* from moss gatherings 1, 4, and 10, a "cristate" form quite distinct from *E. cristata*. These species are fully described and figured in a paper read before the Linnean Society on 4th May last.¹

Gatherings of this type are not very suitable for the examination of Heliozoa, but the following species occurred in the sphagnum material :—

Actinophrys sol., Ehrenb., in 1, 3, and 4.
Actinosphaerium Eichhorni (Ehrenb.), Stein, in 1.
Raphidiophrys pallida, Schulze, in 7 and 12.
Acanthocystis pertyana, Archer, in 1, 7, 8, and 10.
Hedriocystis reticulata, Penard, in 1.

(The numbers refer to the columns in Table I.)

From the foregoing tables the following general observations can be made :—

1. The following genera and species appear to be restricted to sphagnum.

Genera : Hyalosphenia.	<i>Euglypha compressa.</i>
Placocysta.	<i>Nebela tubulosa.</i>
Ditrema.	<i>flabellulum.</i>
Amphitrema.	<i>carinata.</i>
Species : <i>Sphenoderia fissirostris.</i>	<i>marginata.</i>

2. The following species seem to be restricted to the drier mosses :—

<i>Amœba verrucosa</i> ;	<i>Pontigulasia spiralis</i> ;
<i>Diplophrys timida</i> ;	<i>Nebela lageniformis</i> ;
<i>Diffugia lucida</i> ;	<i>bigibbosa</i> ;
<i>arcula</i> ;	<i>Heleopera sylvatica</i> ;

while *Sphenoderia dentata* appears much more abundantly in them.

3. The special abundance of "Filose" forms as compared with the results of previous workers (West records 7 species, Murray 8, Evans and Penard 19).

4. The wide distribution of some species frequently regarded as rather rare, e.g. *Placocysta spinosa*, and *Sphenoderia fissirostris*.

5. The record of some species apparently for the first time for this country — e.g. *Nebela longicollis*, *N. tubulata*, *N. bigibbosa*, *Sphenoderia macrolepis*, etc.

¹ 'Observations on some new and little known British Rhizopods,' in the orthcoming part of the "Journ. Linn. Soc. Zool.," vol. xxxii, No. 212 (1911).

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MAN'S INFLUENCE ON THE INDIGENOUS FLORA OF ABERDEEN.

By JAMES W. H. TRAIL, A.M., M.D., F.R.S.

(*Continued from p. 180.*)

The following is a brief analysis of the species that there is reason to believe occurred within the municipal area of Aberdeen, but that have not been observed there for several years, and may be regarded as extinct, with mention of the causes of their disappearance so far as known:—

Cochlearia danica, L.—Formerly on the estuary of the Dee, while that existed, but not common.

Viola palustris, L.—Disappeared when its habitats (marshy places on moors, in woods, etc.) were drained and cultivated, except a very few survivors on wet shingles by the Dee.

Sagina nodosa, Fenzl.—Formerly on Stocket Moor, by the estuary of the Dee, and on the Links, but now apparently extinct, unless a very few plants may survive on wet spots on the low part of Old Aberdeen Links. I have not seen it there for some years.

Hypericum perforatum, L.—Formerly in the Den of Rubislaw.

H. quadrangulum, L.—In various places in Rubislaw and Gilcomston; probably destroyed there by drainage of habitats.

H. humifusum, L.—Formerly in natural pastures.

Linum catharticum, L.—In natural pastures; become extinct through agriculture.

Genista anglica, L.—On moors (e.g. Stocket Moor in 1833), with which it disappeared.

Ononis repens, L.—On the Old Aberdeen Links before 1840; not common. It has not been seen there for many years.

Astragalus danicus, Retz.—On a slope of the Broadhill, in the Links; but destroyed by the use of the ground for amusements. In 1902 a small patch was observed on the outer sand-dunes, about $\frac{1}{4}$ mile away; but the formation of a carriage drive on the dunes has destroyed it.

Vicia hirsuta, Gray.—Noticed by Skene “in arvis,” and by Dickie in broken ground at Rubislaw, where it may have been native.

(*Prunus spinosa*, L.—Had probably grown in thickets by the streams, as it still does at no great distance, but had disappeared with the thickets.)

Potentilla procumbens, Sibth.—Still common on moors in the vicinity; disappeared with the moors.

P. palustris, Scop.—Plentiful in the marshy soils, seemingly became extinct in Aberdeen when Ferryhill Moss was drained, before 1850.

Saxifraga granulata, L.—Formerly on the Broadhill and Links, but long extinct; possibly gathered for its interest, botanical or otherwise.

(*Parnassia palustris*, L.—Probably grew in the marshes in the parish, as it does in neighbouring ones, though there is no actual evidence of its having done so; and it would not survive drainage of its habitats.)

Sedum villosum, L.—Recorded from Rubislaw Den (in 1802) by Knight, and from Stocket Moor (in 1833) by Dickie, this has long been extinct locally.

Drosera rotundifolia, L.—Common formerly on the wet moors and peat mosses in the parish, but has been extinct at least since Stocket Moor was cultivated, about 1880.

Hippuris vulgaris, L.—In peat mosses; it became locally extinct when Ferryhill Moss was drained.

Peplis Portula, L.—The latest record in Aberdeen dates from sixty or seventy years ago, the localities in which it grew having been drained.

Epilobium palustre, L.—Though still common in marshes in the vicinity, this has not been noticed in Aberdeen since the local marshes were dried.

Hydrocotyle vulgaris, L.—This was formerly plentiful; but it appears to have become extinct in Aberdeen since 1903, when its last habitat here was rendered unsuitable by being covered with town-refuse, to form a football ground on Old Aberdeen Links.

Apium inundatum, Reichenb. f.—The same remarks apply to this as to *Peplis Portula*.

Galium uliginosum, L.—Recorded from several localities within our area before 1840; but this, no doubt, perished locally when the marshes were drained.

Valerianella olitoria, Poll.—Recorded from a limited part of the dunes near Old Aberdeen, and from a field near Woodside, this was probably indigenous here; but it has apparently not been found during the last seventy years.

Aster Tripolium, L.—Found on the estuary of the Dee before 1840 by Dickie, though probably scarce; and it seems to have become extinct there long before the estuary was altered. It is plentiful by the S. Esk near Montrose, and occurs in smaller quantity by the estuary of the N. Esk; but it does not now grow near Aberdeen.

Filago germanica, L.—Recorded as a rare plant on waste ground and tops of walls “in arenosis siccis” (Skene), and about Stocket and Rubislaw (Knight and others), this species seems not to have been found within Aberdeen area for a long time.

Antennaria dioica, R. Br.—Disappeared almost wholly with the reclaiming of the drier moorlands.

Taraxacum officinale, Weber, var. *palustre* (DC.).—Once common in the marshes, but locally extirpated (or nearly so) by drainage.

Menyanthes trifoliata, L.—No doubt formerly common here, and recorded from one or two of the marshes in the early part of last century, this species has perished through drainage and cultivation of its habitats.

Mertensia maritima, S. F. Gray.—In very small quantity in the sand at Donmouth in 1835. There is no later record for Aberdeen. It was not uncommon among shingle at the Bay of Nigg, where it was noted by Beattie; but it became extinct there before 1880, owing to the shingle being removed and used to form concrete blocks for building the South Pier at the mouth of the Dee.

Veronica scutellata, L.—Formerly common in wet moors and in swamps, this seems not to have survived here when its haunts were drained.

Bartsia Odontites, Huds.—Found in damp natural pastures and by roads in damp spots, this species has not been observed in Aberdeen for about thirty years, so far as I can learn.

Pedicularis palustris, L.—Though, no doubt, once plentiful on all wet moors and in peat mosses in Aberdeen, this appears to have ceased to exist locally when the surface was drained.

Utricularia vulgaris, L. } Both species are recorded as found in
U. minor, L. } the peat moss at Ferryhill, and may have
 existed earlier in other mosses or swamps also within the
 parish. They must have become extinct locally when these
 ceased to exist, that is, before 1850.

Pinguicula vulgaris, L.—Formerly common on wet places on moors, the butterwort seems to have disappeared from Aberdeen with the cultivation of Stocket Moor about 1880, though it may linger on moist banks in out-of-the-way spots.

Calamintha Clinopodium, Spenn.—Formerly this grew here and there on rough banks of the Dee and on islands in the estuary. It was not common, and seems not to have been observed in Aberdeen since 1863. The banks have been so altered since then as to make it unlikely that it will re-establish itself on them.

Salicornia herbacea, L.—Near the mouth of the Don early last century, but apparently in small amount, and became extinct there before 1830. It is common in the estuaries of the S. Esk and N. Esk to the south, and of the Ythan to the north.

Polygonum Hydropiper, L.—Abundant in the earlier part of last century around certain pools and mill dams in the west part of Aberdeen, this species appears to have been extirpated locally when these pools were filled up.

P. minus, Huds., was recorded by Knight from Gilcomston Dam. There is no other note of its occurrence within Aberdeen; but it is fairly common by the Loch of Loirston, two or three miles south of Aberdeen.

(*Myrica Gale*, L.—May well have grown on the wet moors in Aberdeen, as it still does in most of the adjoining parishes; but the only record of its occurrence here is in a list so full of evident errors as to lack authority.)

Corylus Avellana, L.—No doubt this grew in the thickets by streams, but it has disappeared with these, until there exists, so far as I can ascertain, only one example of it in the parish plantation in the district of Rubislaw.

Empetrum nigrum, L.—Though no doubt plentiful formerly on the moors, this seems now to have become almost, if not quite, extinct within Aberdeen, since the moors were broken up for cultivation.

Orchis latifolia, L.—Common on the wet moors and in the marshes, this became extinct in Aberdeen when its habitats were drained and cultivated.

- Habenaria Conopsea*, Benth., *H. bifolia*, R. Br.—As they still grow on moors in the adjoining parishes so these occurred in Aberdeen in suitable habitats; but they seem to have become extinct here when Stocket Moor was cultivated.
- H. viridis*, R. Br.—In short dry pasture on dunes near the Don, never common, and not observed since I saw one there in 1902. It is common on Balgownie Links just across the Don.
- Iris Pseudacorus*, L.—In the early part of last century this was plentiful by the Canal (from near Aberdeen Harbour to Inverurie), and also in sluggish streams by the Links. The Canal was dried and used for a railway before 1860, and alterations in the streams led to the disappearance of the Iris.
- Narthecium Ossifragum*, L.—This has shared the fate of other species formerly plentiful on wet moors and in swamps in Aberdeen, having become extinct locally when Stocket Moor was cultivated.
- Alisma Plantago-aquatica*, L.—Abundant early last century in Gilcomston Dam, this, for some unknown reason, had almost disappeared from there before 1900, when the pond was filled up. It seems to be extinct locally.
- Potamogeton heterophyllus*, Schreb.—This formerly grew in the Canal, but disappeared from Aberdeen when the Canal was dried.
- P. crispus*, L.—Formerly in the Canal and in Gilcomston Dam. It was plentiful in the ponds of Rubislaw Bleach-works, but in 1908 it perished when the ponds were emptied, in consequence of the works being moved elsewhere.
- Ruppia rostellata*, Koch.—Discovered in pools by the estuary of the Dee in 1849. The estuary was practically done away with by the changes made in the channel before 1870. *Ruppia* has been extinct locally for years.
- Scirpus fluitans*, L.—“In a pool near Hilton, abundantly” (Harvey, before 1830); but apparently extinct locally long ago.
- S. rufus*, Schrad.—Formerly on the Old Aberdeen Links, but not observed there since 1870; possibly choked by sand.
- Eriophorum angustifolium*, Roth. } Both must have been common
Carex dioica, L. } in wet places on the moors in
 Aberdeen; but neither is now known to exist there.
- C. incurva*, Lightf.—On Old Aberdeen Links, first noted by Beattie in a letter to Smith in 1800. It grew in one or two localities, not plentifully; but appears to have been last observed there about 1870.
- C. vulpina*, L.—Recorded by Skene “in the Old Town Links” before 1770. It has long ceased to grow there, though not uncommon on the north shore of the Don.

- C. canescens*, L.—The same remarks apply to this as to *C. dioica*.
- C. helodes*, Link (*C. laevigata*, Sm.).—Described by Smith in 1804, with reference to examples from "Marshes near Aberdeen, Prof. J. Beattie, Junr.," and recorded from Rubislaw (Harvey, 1826); but long extinct within Aberdeen.
- (*C. distans*, L.—Is plentiful on the coast of Kincardineshire, and must have grown by the estuary of the Dee, though there is no actual record of its occurrence there.)
- C. fulva*, Host.—Seems to have become extinct locally about 1880, on the cultivation of Stocket Moor.
- Phleum arenarium*, L.—"Formerly on Old Aberdeen Links" (Dickie).
- (*Deschampsia setacea*, Hackel.—Grows in so many places on wet moors in the vicinity of Aberdeen that it must have occurred within the parish in similar habitats. As these had been drained and cultivated before the species was distinguished in Britain from *D. flexuosa*, the absence of any record is no evidence that it did not grow in Aberdeen formerly).
- Avena pubescens*, Huds.—Recorded from a locality near Old Aberdeen (destroyed by the opening of a sand-pit a good many years ago), and from near Seaton House, this has not been observed within the parish for some time. It is very common beside the Don, so may reappear on the bank within Aberdeen.
- Phragmites communis*, Trin.—Probably common at one time within Aberdeen in swamps, but extinct locally for over half a century.
- Catabrosa aquatica*, Beauv.—Abundant for a time as late as 1885 in sluggish streams and pools beside and on the Links; but extirpated locally by the filling up of the pools and covering over of the streams.
- Lastræa montana*, T. Moore (*L. Oreopteris*, Presl.).—Found near Ruthrieston by J. Roy in 1864. This is very rare near Aberdeen, though widespread and often common in the uplands.
- Phegopteris polypodioides*, Fée.—"Above Stocket roadside" (Beattie). This is the only record for Aberdeen; and the fern is rare in the vicinity.
- Osmunda regalis*, L.—Knight records that it "grew till 1797 in the Marsh, Broadhill." There is no other note of its occurrence within Aberdeen; and the marsh in question was drained long ago, and has for many years been the site of a cloth factory. At no time common in N.E. Scotland, this fern is now almost extinct in the counties near Aberdeen.

Of the Lycopodia or club mosses, no species has been recorded from the parish of Aberdeen ; but the following have been found on the moors on several of the adjoining parishes, and almost certainly had grown on the moors of Aberdeen also, though probably in small amounts, and had perished when these were cultivated :—

Lycopodium Selago, L.

L. alpinum, L.

L. clavatum, L.

Selaginella selaginoides, (Link.).

In addition to the above list, which includes only such indigenous species as there is reason to believe have become virtually extinct, mostly during the last century, within the limits of Aberdeen, a number more are likely to follow in a few years.

The scanty remnants of moor still existing on the western edge of the parish form the last local refuge of the heaths (*Erica cinerea*, *E. Tetralix*, and *Calluna vulgaris*) *Pyrola minor*, *Pedicularis sylvatica*, *Listera cordata*, *Goodyera repens*, and *Carex echinata* ; but these will almost certainly disappear in some years before the advancing streets.

Near the Don, to the west of the dunes or sandhills, is a low part of the Links, liable to be overflowed by brackish water at the times of exceptionally high tides, and broken by small pools containing slightly brackish water. On this ground, in the pools and by a stream that flows through it, unfortunately carrying a good deal of sewage, grow plants some of which are not found elsewhere in this part of Scotland, while others are now very rare elsewhere near Aberdeen, since the alterations on the estuary of the Dee extirpated them from that habitat.

The changes that are in progress, by direction of the Town Council, with the aim of shutting out the tidal water from the Links, of covering up the stream, and of drying the soil to render it suitable for golf and other games, will lead to the almost certain extirpation from the Links of several species, already greatly reduced by changes effected on the Links since 1900. Among these plants are :—

Ranunculus sceleratus, L.—A few years ago was common on the Links, but already is almost extinct there. It formerly grew in other localities also near Aberdeen.

Sagina maritima, Don.—Formerly common by the Dee, but almost extirpated there, this species is likely to become as rare on the Links.

Spergularia media, Presl., } Both were common formerly
S. salina, Presl., var. *neglecta* (Kindb.). } in the estuary of the Dee,
 but both have practically become extinct there, except that a
 few plants of *S. media* grow on the coast east of Torry. Both
 will disappear also from the Links when the water is shut out.

Glaux maritima, L.—In turf near the Don.

Triglochin palustre, L.—Formerly in moorland swamps, and by the estuary of the Dee ; now limited to the low ground on the Old Aberdeen Links.

T. maritimum, L.—Almost extinct near the Dee, but still plentiful on the Links near the Don.

Potamogeton pectinatus, L.—In the pools on the Links, but not known elsewhere near Aberdeen.

Eleocharis uniglumis, Schultes.—Still plentiful on the low part of the Links, though already on a much restricted area.

Scirpus pauciflorus, Lightf.—This must have occurred in suitable wet and nearly bare places on most moors, and by the estuary of the Dee ; but it now appears to be limited in Aberdeen to the low part of the Links, and will probably die out when the tide is shut out.

S. maritimus, L.—By the stream and in the shallow pools, on the Links, in patches, still fairly plentiful.

Glyceria maritima, Wahlb.—Plentiful among short vegetation on the low part of the Links.

Even more marked in the influence on the flora of the parish than the disappearance of species, of which some had always been locally rare, is the diminution in numbers of many species that had formally been conspicuous and widespread, so that some of these are now restricted to the rocky or stony banks of the rivers, others to Rubislaw Den, or to the débris of quarries or to water collected in the pits of these quarries, or to occasional spots too barren for cultivation or left unoccupied for any other reason. Some of the species also may not improbably disappear from within the limits of Aberdeen.

To enumerate those species that were plentiful at a former period, but are now rare in Aberdeen, would be tedious. They were largely dwellers on wet or peaty soils, and have been unable to survive drainage and cultivation of the soil. Hence they find their refuge on the rough banks of streams, or on the slopes on the coast, especially if moist, or on débris of quarries and similar materials, or in such places as railway cuttings.

Some of the plants of natural pastures are also apt to suffer, such as *Pimpinella Saxifraga*, *Conopodium demidatum*, *Stellaria Holostea*, and numerous others, which appear unable to thrive properly in ground brought under cultivation. Against the extirpation or diminution of many species of indigenous Flowering Plants due to man's influence may be placed the great increase shown by others, which can adapt themselves to the new conditions, and become

troublesome weeds of both arable land and pasture or hayfields, *e.g.* thistles, dandelion, and their allies, ribwort and broad-leaved plantains, docks and sorrels, tall oat-grass, couch-grasses, etc.

But consideration of these results of man's actions and of the flora which he has been the means, often unintentionally, of introducing, and in part of establishing, around Aberdeen, must be deferred.

TREE-DISEASES DUE TO FUNGI. ADDITIONAL SCOTTISH RECORDS IN 1910-11.

By CHARLES O. FARQUHARSON, M.A., B.Sc.

IN making a collection of tree-diseases due to cryptogamic parasites the following new occurrences were noted. They are mainly from the district round Aberdeen.

i. *Yew Leaf Scorch*.—This disease occurs at Durris on several old park trees in the grounds of Durris House, where it seems to be working a considerable amount of damage. The parasite is *Sphærulina Taxi* (Masseé). The dead leaves showed an abundance of sunken perithecia, which proved to belong to two fungi. One of these was *Anthostomella Rehmii* (Thüm.), a saprophyte. A specimen of this was sent to Kew for confirmation, and on this the conidial stage of the *Sphærulina* was detected. Mr. Masseé, regarding this disease, makes the following note ("Diseases of Cultivated Plants and Trees," 1910): "As a rule when this parasite once attacks a tree it spreads very rapidly, so that within a short period all the leaves have fallen; many of the younger shoots are also killed and fall to the ground. If the disease attacks a tree for two or three years in succession, it is usually killed outright." As yet it has not been recorded from many localities, and none of these are in Scotland.

ii. *Douglas-Fir Disease*.—Several diseases of Douglas Fir are found commonly in Aberdeenshire, viz. *Sclerotinia Fuckeliana* (De Bary), (= *Botrytis Douglasii*, Tubeuf.), and *Phoma pithya*, Sacc.; but neither of these can as yet be said to be a serious pest. The *Phoma* is generally on the leader shoot of young plants, and it is difficult to say whether frost

may not be the original cause of death. In one locality, however (Drumtochty), it was observed lower down the stems of plants about six years old, where the pycnidia were developed abundantly on sunken patches of reddish colour, as if the part had been scorched. In Drumtochty another disease also was observed which appeared to be doing some damage. It occurred on trees of about fifteen to twenty years old. The lower part of the stem, from the ground upwards for about two to three feet in some cases, was covered by a dense brownish mycelium, which disappeared later in the season, and was succeeded in late autumn (of last year) by abundant pale yellowish white apothecia, which later became pale brown. No record of such a disease could be found ; and a specimen was sent to Kew for identification. The fungus proved to be *Sclero-derris livida*, Massee, which has hitherto been recorded only as a saprophyte.

iii. An outbreak, of a severe character, of rust on young Alders (*A. glutinosa*) was observed last summer and autumn in a nursery at Aberdeen. The fungus proved to be *Melampsora betulina*, Pers. One-year-old plants only were attacked ; and in no case was the rust observed on older plants, though these were present in the nursery quite near the attacked beds. The previous year the same beds had been planted with young birch, which suffered so severely from the fungus that they were thrown out. It is noteworthy that though in this nursery, and in the large mixed wood adjoining, species of *Melampsora* occur on several trees, Birch, Willows, Aspen and other Poplars, and Alder, *Cæoma*-forms are practically unknown. In this connection it is also interesting to note the entire absence of Pine-blisters (*Peridermium*) though *Coleosporium Senecionis* is one of the commonest rusts round Aberdeen, even inside the nurseries.

iv. Near Murtle Hydropathic, in the grounds of a private house, an interesting occurrence of *Taphrina aurea*, Pers., was observed. This fungus is extremely prevalent on *Populus nigra* in the district. It was also found on another tree which Professor Trail found to be *Populus balsamifera*. The effects of the parasite were identical with those on

P. nigra, from which it had undoubtedly spread. Saccardo mentions its occurrence on several poplars, including *P. alba* and *P. candicans*, both of which are common park-trees near Aberdeen, but none of these are attacked. The following diseases were also observed, but were not doing serious damage.

1. An *Oidium* on *Cytisus laburnum*, no ascigerous stage occurred.
2. *Erysiphe Martii* (Lév.), on *Robinia pseudacacia* in a nursery near Aberdeen. In the same nursery the Peas were severely attacked by this fungus.
3. *Hypoderma strobicola* (= *Hypoderma brachysporum*, Rostr.) on *Pinus Strobus* in a nursery. In this case the trees (about six years old) had been killed, but other factors were also present which might have been accountable for their death. The discomycetous fungus *Peziza subtilissima*, Cke., was present, and had caused drying and rupture of the bark. Of the two it seemed to be the more serious agency and the primary cause of death.

DISTRIBUTION OF *GOODYERA REPENS*.

By ARTHUR BENNETT.

Goodyera repens, R. Brown, in Aiton's "Hort. Kew." ed. 2, v. (1813), 198.

Satyrium repens, L., "Sp. Pl.," ed. 1, ii. (1753), 945.

Peramium repens, Salisb., in "Trans. Hort. Soc.," (1812), 261.

"Creeping Lady's Tresses."

"Creeping Satyrium," Huds. "Fl. Angl.," ed. 3 (1798), 387. Sowerby's "Eng. Bot.," t. 289, ed. 3, t. 1475.

First record in Britain is—"We found it in an old shady hanging birch wood, about two miles from the head of Little Loch Broom, Ross-shire," Lightf., "Fl. Scot.," i. (1777), 520. "Old birch wood called Ca-bue, or Yellow hill."¹

¹ Smith, "Eng. Fl.," ed. 2, 1828, iv. 34.

This shows a similar coming south to *Pyrola secunda*, L., but with far more difficulty as to the status of the plant where found.

Cumberland, Co. 70.

"In a Fir plantation near the Eden at Armathwaite, between Penrith and Carlisle," F. A. Lees, in "Rep. Bot. Record Club," for 1879-80 (1880), pp. 59 and 72.

York, S.E., Co. 61.

Reported from Houghton Hall Woods, near Market Weighton, as *Spiranthes autumnalis*,¹ but afterwards corrected by Mr. Slater to *Goodyera*.² W. W. Reeves, sp., in no way different from Kincardineshire specimens.

Norfolk W., Co. 28.

1. Decoy Wood, Westwick,³ "one large patch," July 8, 1885, by Miss Southwell. A week after the wood was carefully searched, but no more could be found.

2. Neighbourhood of Holt, where it was found in abundance by Miss A. M. Barnard, 1890. This locality is about twelve miles "as the crow flies" from Westwick, where it is now (1890) exterminated.

3. Cawston Woods, Mr. W. A. Nicholson, sp., 25, 7, 1910. "About twenty specimens, with six flowering stems, among *Erica cinerea*, and rather near to several Scotch Firs, at the edge of a clearing." In the 1890 "Transactions of the Society," the late Mr. Geldart expresses the opinion that it cannot be a wild (*i.e.* indigenous) species to W. Norfolk. I also expressed this opinion,⁴ and Mr. Burrell remarks,⁵ "this judgment was a sound one, judged by the information available at the time, but more recent developments may modify it." Mr. Burrell's remarks are too long to quote in full; but the species has been found among heather and firs over an area of some thirty square miles.

He wrote to three nurserymen in Dumfries, Elgin, and Kilmarnock, who are directly concerned in the culture of Scotch Firs, and they all agree that they are raised from seeds, which are kept more or less free from weeds, and *Goodyera*

¹ "Naturalist," 1888, p. 279.

² "Naturalist," 1888, p. 312.

³ "Trans. Norf. and Nor. N. Soc.," 1885, 255, and 1890, 329.

⁴ "Journ. of Botany," xl. 393.

⁵ "Trans. Norf. and Nor. Soc.," 1910, p. 44.

has never occurred in their nurseries. Mr. Burrell¹ then goes into the question of its being indigenous very fully, and says in several cases it has been brought to him as *Spiranthes*.

Woods are its usual habitat, but it does occur in the open in Orkney and Banff. (Barclay sp.).²

Dr. Nordstedt of Lund writes :—"I have seen *Goodyera* abundant on the west coast of Norway in open ground where the air is very moist, and I think that *Goodyera* can grow in open ground (open moors, but not wet) in Orkney, as the air is probably damp enough there."

He goes on to say that *Goodyera* is a saprophyte, as O. Drude says in "Die Biologie von *Monotropa* u. *Neottia*, 1873"; and Blytt in "Norges Flora," i. p. 357, says, "In the Alps, where it sometimes grows higher than (the) Pines."

In Scotland it is now on record for Co. 75!, 80, 81!, 82, 84, 85, 88 to 97, 105 to 108, 111!.

In England it has occurred in Co. 27!, 61!, 67, 70.

It extends from sea-level at Kinloss³ to 1000 feet,⁴ and on the mainland of Scotland north to 58° 27' near Tongue in Sutherland (Marshall and Shoolbred), and 57 57', at Little Ferry Wood, near Golspie in E. Sutherland. (Grant, sp.)

In continental Europe it extends north to Russian, Finnish, and Swedish Lapland, at Elvenaes to 69° 50' N. Lat. (T. Fries, 1864). In Denmark it has been found recently in Bornholm (it is not given in Bergsted's "Bornholms Flora," 1883), and in Sjælland. It is recorded from Holland, south to North Alps in Italy and Dalmatia, Siberia, China, Himalayas, Canada (Atlantic to Pacific Coast), north to Fort Franklin, Pease River, and Alaska, south to Massachusetts and Colorado. In America it is called "Northern Rattlesnake Plantain."

It is said to disappear from woods after cutting down of the trees, and also after destruction of the trees by storms.⁵

¹ "Trans. Norf. and Nor. Soc.," 1910, pp. 43-46.

² "Ann. Scot. N. Hist.," 1908, 258.

³ "Coll. Fl. Moray," 1839, p. 26.

⁴ "Bot. Guide to Aberdeen, etc.," 1860, p. 160.

⁵ "Trans. Perth. Soc. N. Sc.," 1893-8, ii. 208.

ZOOLOGICAL NOTES.

On the Occurrence of *Erithacus rubecula rubecula* on South-West Coast of Scotland.—On 2nd November 1910 a ♂ robin was sent to me from Mull of Galloway Lighthouse by Mr. Henderson the Lightkeeper. I thought the bird was *Erithacus rubecula rubecula* and my opinion was confirmed by Mr. H. F. Witherby, who kindly examined it for me.—ANNIE C. JACKSON, Swordale.

Crossbills at Lerwick.—The Crossbills are again paying us a visit. The first that I heard of them was at Seafield, near Lerwick, on 11th inst., but my friend Geo. W. Russell tells me he heard of them before that date. I saw none until last Sunday (23rd), when I saw a young bird in the garden in the afternoon. On Monday morning I started a cock and three hens which were feeding on an apple tree in the garden. The same afternoon in the garden, I saw a cock and four hens, I watched them at close quarters feeding on the apple trees and honeysuckle. Later in the afternoon I saw some hens feeding on the red currant bushes. On Tuesday I saw no birds. With the exception of the first bird, all were adults.—JOHN S. TULLOCH, Lerwick.

Willow-wren's Nest in an old Song-thrush's Nest.—On 18th June last I discovered a Willow-wren's nest situated $3\frac{1}{2}$ feet from the ground in a little dead spruce tree, surrounded by thickly-planted young Scots firs. On taking this nest to pieces after the young birds had fledged I found that it had been built in an old Song-thrush's nest, the decayed-wood lining of which was still intact. The foundations of the warbler's nest were of ordinary dimensions and material, but the dome was unusually flimsy and incomplete, and the customary feather-lining was almost absent, only two or three feathers being noted.—S. E. BROCK, Kirkliston.

Local Variation in Song of Tree-pipit (*Anthus trivialis*). When in the Rothiemurchus district of Inverness-shire in early June this year I was much struck with the character of the song of the Tree-pipits of the locality, which song was very markedly distinct from what one is accustomed to hear in the Lothians. While the whole passage was readily distinguishable, the variation was greatest in the opening notes, which bore considerable resemblance to the analogous ones of the Chaffinch. All the Tree-pipits heard in the district sang approximately the same strain. Local variation of bird song and note is much more marked (or recognisable) in some species than in others, the Chaffinch being an outstanding example. The song of the latter in West Lothian, for instance, is quite easily separated from that of the birds of South Perthshire, and even of Peeblesshire. When in Hampshire a few years ago I detected local "accent" in

several birds, amongst which the Wren and Chaffinch were prominent. The subject is rather a neglected one, although of considerable interest. Mr. H. Eliot Howard makes some interesting remarks on it in his "British Warblers" (part iv. p. 16).—S. E. BROCK, Kirkliston.

Dendrocopus major major in East Ross.—In October 1909 a ♀ Greater Spotted Woodpecker was shot near Dingwall and came into my possession. The other day I had the opportunity of submitting the skin to Mr. H. F. Witherby, who compared it with his series and pronounced it to be *Dendrocopus major major*. The bill of the bird compares exactly with those of Greater Spotted Woodpecker from Norway in its obtuseness and stoutness. Further, the first (bastard) primary is longer than the longest primary covert, whereas in *Dendrocopus m. anglicus* the reverse is the case (cp. C. B. Ticehurst, "British Birds," iv. 337). My thanks are due to Mr. Witherby for his identification of the bird.—ANNIE C. JACKSON, Swordale.

Green Sandpiper in the Island of Lewis.—On 3rd August my brother shot a Green Sandpiper beside Loch Ossigary near Rodel, South Harris. It is a ♂, autumn plumage, second year, as I am informed by Mr. Bisshopp of Oban, to whom I sent the bird in the flesh. I fancy this is the first recorded specimen from the Lews.—A. T. A. RITCHIE, Obbe.

The Breeding Range of the Fulmar Petrel (*Fulmarus glacialis*) in the British Isles.—This has been greatly extended of late years. When in Hoy (Orkney) in July 1911 I found the species breeding plentifully there. As far as could be ascertained the birds first appeared at the north end of the island five or six years ago; a few Fulmars came at first, but they have greatly increased until in the present year I estimated that there must be hundreds of pairs nesting between the Kame and the Old Man of Hoy. On the west coast, farther south, they were first noted three years ago; since then they have increased enormously. At the south end of the island a few birds were noticed in 1910, but none bred there. This year three pairs are nesting. The fishermen assert that the Fulmar is master of all the Gulls, driving them away from any food which both desire. This fact is probably not unconnected with the great increase of the Fulmar.—ERIC B. DUNLOP.

Increase of Mute Swans in Tiree.—There have been a great many Mute Swans on Loch Vasapol all summer. They began to come in June; and towards the end of July I counted 75 one day and that number remained for a considerable time. I counted them again yesterday (5th September 1911) and there were only 51, so they are beginning to leave. They are feeding on a weed that grows in great profusion there. I don't know the name of the weed, but it has a small white flower, and it grows in as much as

12 feet of water. The Swans seem to be very fond of it, as they pull up an immense quantity of it and it then comes ashore. The Swans are all on Loch Vasapol, and do not seem to frequent the other lochs. The weed does not grow in any of the other lochs.”
—P. ANDERSON.

[From an examination of specimens submitted it appears that the weed is *Potamogeton pectinatus*, L.—EDS.]

King-fish at Shetland.—At the beginning of July I saw on the shore at Maywick, near Scalloway, Shetland, a King-fish or Opah (*Lampris luna*.) It was seen alive in the bay before stranding. In length it measured rather over 3 feet.—ERIC B. DUNLOP.

Alepidosaurus ferox off St. Kilda.—An example of this fish was captured about the 7th or 8th July in about 200 fathoms some 50 miles south-west of St. Kilda. It measured 6 feet 5 inches in length.—JOHN SAWERS, Glasgow.

Lapwings and Black-headed Gulls.—The habit mentioned by Mr. Ussher (“Birds of Ireland,” p. 322), and referred to before in our pages by S. E. Brock, Kirkliston (*loc. cit.* p. 117, 1909), of the persecution of the Lapwings by the Black-headed Gulls, is growing apace. Not only when the ground is hardened by frost, or alone in the winter months, but also when the grass-lands are dried up by drought and the Lapwings first flock in the months of July and August, are the poor persecuted birds attended by famishing and hungry Black-headed Gulls. A fleet of say 50 Lapwings alighting in our meadow or alluvial haughland here, are constantly attended by about from 4 to 6 Black-headed Gulls; and whenever a Lapwing catches a worm or grub, the nearest sentinel Gull makes a dash for the prize. This is of constant occurrence. See also earlier records of same in winter by Mr. Laidlaw, *op. cit.* 1908, p. 141; also by W. Evans and W. E. Clarke, *op. cit.* 1908, p. 255.—J. A. HARVIE-BROWN.

Bass in “Scotch Waters.”—A small Bass—now preserved in Dunipace House—was captured in my presence by a friend, on a small “Jock Scott” Salmon fly, at the tide-run of the Sea-pool of the River Aylort in Moidart, and was given to me. It was a gamier fish than any sea-trout of similar size I ever met with; indeed appeared oftener to be some 3 feet above the water than in it, after being hooked. It weighed 1 lb., and was as bright as a new shilling all over back and side alike, like a gleaming bar of silver. I mention it here, as a record of a somewhat rare Scottish fish—or otherwise one seldom seen. Bass, however, are not so rare as supposed, and are known to occur, and are fished for and caught, in the Kyles of Durness and Tongue by Anglers frequenting these quarters.
—J. A. HARVIE-BROWN.

Gannet at Lighthouse, Butt of Lewis.—Robert Clyne ("A.S.N.H.," 1911, p. 69) remarks on the passing of Gannets, at the Butt of Lewis. He understands the passing S.W. in spring of continuous flocks when they are probably resorting to their usual breeding haunts, but why the majority should pass daily in a S.W. direction during the summer puzzles him. There really is no mystery about it whatever, and every fisherman knows about it whether he be East or West Coast. As many people are unaware, it is the East Coast people who follow the herring, *not* the West Coast inhabitants, and it is greatly by the well-known and understood motions of the Gannets that these fishermen are enabled to know of the arrival of herrings on west and east sides of the country. Some Gannets also range after mackerel when that other abundant species swarms on our shores in latter half of July, August, etc. Even in October off the Isle of May, when mackerel have become scarce and have returned to deeper water and grown to a larger size, even then Gannets may be seen plunging—not for herring, but for mackerel.—J. A. HARVIE-BROWN.

Wood Sandpiper (*Totanus glareola*) in Fifeshire.—I have been asked to record in the "Annals" the occurrence of a Wood Sandpiper, at the Morton Lochs, near Tentsmuir, Fifeshire, on 1st August last. These lochs—artificial fishing lochs—surrounded in normal seasons by a good deal of marshy ground, are situated within half a mile of the Tay estuary, and are very attractive to waders and to wild fowl of all sorts.

On the day in question, the bird, a female, and I believe a bird of this year, rose from a shallow pool near these lochs, calling loudly as it rose. The note was entirely new to me; but as the bird, though out of range from me, flew somewhat in the direction of my friend, Mr. Hog of Newliston, who was shooting with me that day, I called out to him to secure it if possible, and this, by a remarkably long shot, he was able to do. The bird has been presented to the Royal Scottish Museum.

Authentic records of the occurrence of the Wood Sandpiper in Scotland are few. It has been met with rather more often in England, and has even been known to breed there (see Yarrell, iii. 464-5); but on this side of the border, since the three or four occurrences recorded by Gray in the "Birds of the West of Scotland," which mostly date from the early fifties of last century, the bird does not appear to have been obtained at all, until 1st Sept. 1902, when one was shot in the Orkneys ("Zool." vi. 391). The reputed breeding of the bird near Elgin in 1853, as recorded in the "Ibis" for 1865, and generally since, is sufficiently dealt with in Mr. Evans's article in this Journal last year ("Annals," xix. p. 74). Other records of the bird in such books as I happen to have beside me here, including Harvie-Brown's "Moray Basin and Tay," seem

equally attended by doubt. The Wood Sandpiper then can still only be described as a casual visitant, of rare occurrence, and chiefly on autumn migration.

It is quite possible nevertheless—at least in my opinion—that such visits may be more frequent than the fewness of the records would allow one to suppose. On the wing the bird is exceedingly like the Green Sandpiper, and the Green Sandpiper, though by no means a very familiar bird to many of us, is yet of not infrequent occurrence on our shores. Having myself, as I believe, seen both birds in the same week, I can say that it would be exceedingly hard for any ordinary person to distinguish the one from the other in life. The only method of identification which suggests itself to me, for anyone who is not personally familiar with both *ochropus* and *glareola*, is the size of the white patch on the lower back. This appeared to me, as the bird rose, to be smaller than the patch on a Green Sandpiper or on a young Greenshank—as in fact it is. There isn't, I think, any other bird with which a Wood Sandpiper is likely to be confused.—WILLIAM BERRY, Newport, Fife.

Scaup Duck (*F. marila*) in August.—On the same day—1st August, at the Morton Lochs, near Tentsmuir, Fifeshire—I shot a male Scaup Duck, in dull, summer plumage. I have no explanation to offer for the presence of an adult and apparently healthy bird of this species at this season. Possibly some former injury or wound may have prevented it from making its usual summer migration northwards. Being in a phase of plumage unusual in British specimens, it was presented to the Royal Scottish Museum.—WILLIAM BERRY, Newport, Fife.

Lesser Rorqual (*Balenoptera acuto-rostrata*) in the Firth of Forth.—On the evening of 21st June last a Lesser Rorqual was stranded on the beach adjoining Musselburgh Links, where I subsequently had an opportunity of examining it. It was a female about $24\frac{1}{2}$ feet in length, and had been pursued by two boats for a couple of hours before it ran ashore. During September several “bottlenosed” whales have been reported on both sides of the Firth. One which I examined near Port Seton was a female *Hyperoodon rostratus* about $16\frac{1}{4}$ feet in length; it came ashore on 23rd September.—WILLIAM EVANS, Edinburgh.

BOTANICAL NOTES AND NEWS.

Utricularia ochroleuca, *R. Hartm.*, and **Eriophorum paniculatum** in the valley of the Dee, in South Aberdeenshire (92), *Druce*.—During the first three weeks of August 1911 I resided in the district of Dinnet, and was able to explore much of it botanically.

The very dry season was prejudicial in many localities, but allowed freer access to swamps than can usually be had. Among the plants found by me were two not previously known to occur in South Aberdeen (V.C. 92).

Utricularia ochroleuca was found in numerous small, shallow, swampy pools on moors over an area of several square miles, often in abundance, and was by far the most common bladderwort in the district, though *intermedia*, *minor*, and *vulgaris* all occur here and there in the district. Now inclining to *intermedia* and now to *minor* in structure and appearance, *ochroleuca* gives very strongly the impression of being a hybrid between these two species. Easily and rapidly multiplied by its apical buds, it does not require to produce seeds; and it appears to be replacing both *intermedia* and *minor* around Dinnet. Both had been known from that district for a good many years; and *ochroleuca* had been probably overlooked as *minor*, which it often greatly resembles. All the species of *Utricularia* are very uncertain in their times of flowering in the north-east of Scotland, several years frequently passing without a flower being observed, and occasionally many flowers showing themselves at the same time.

Eriophorum paniculatum, Druce (*E. latifolium*, Hoppe), was found by me in fair quantity on a swampy slope about half a mile south of the Bridge of Dinnet. It had not previously been recorded from any county between Forfar (Glen Dole) and East Inverness.—JAMES W. H. TRAIL.

Scandinavian Roses.—Under this heading a short paper, by Carl Traaen, in the "Journal of Botany" (pp. 298-300), calls attention to papers of much interest to Scottish botanists, by Dr. S. Almquist, issued during the years 1907, 1910, and 1911. As these papers state conclusions with regard to the classification of the roses differing from those of other systematists, but which are expressed in Swedish, there is reason to welcome the brief statement of their purport in the "Journal of Botany," as regards the forms included by Dr. Almquist under *R. canina* and *R. glauca* (including *coriifolia*). The best character to distinguish these two, regarded by him as true species, he finds in the styles, which in *canina* are prolonged a little above the opening of the disk and are more or less separated, while in *glauca* they are short and densely coherent.

He unites *glauca* and *coriifolia* under the name *Afzeliana*, Fr., including in this varieties that differ in colour and in surface, the hairy being derived from glabrous types. He thus divides *R. Afzeliana* into two glaucous groups, *glauca*, Vill. (glabrous), and *glauциformis*, Almquist (hairy), and two green groups, *virens*, Wg. (glabrous), and *virentiformis*, Almquist (hairy). He does not regard the direction of the sepals of the fruits as diagnostic; but he divides these four groups into parallel series, or sub-species, by the nature

of the leaves, form of leaflets, shape and direction of teeth and of prickles, and forms of fruits. The degrees of serration and presence or absence of hairs on sepals and peduncles he uses only as distinguishing sub-varieties denoted by prefixes as follows: without prefix denotes that the leaflets are simply serrate, or nearly so; *per-* denotes that they are biserrate; *prae-* that they are biserrate with very glandular margins; *ob-* that there are glands on the margins of the sepals; *sub-* that the sepals have dorsal glands, while the serration is simple; *super-* differs from *sub-* only in biserrate margins; *hirtelli-* indicates a transition from a glabrous to a hairy series; *tersi-* denotes that hairs are on the nerves only; *hirti-* that they occur over the surfaces.

Only experience can show the value of such a scheme; but if it stands that test it should be a boon to students of the roses of the British Islands.

The Summer of 1911.—The most noteworthy features of the summer have been, in north-east Scotland at least, the very small rainfall and exceptionally high temperature. In the valley of the Dee the want of rain has led to the drying up of swamps and of not a few streams, while the amount of water has been largely reduced in all. The margins of the Dee yielded a very poor contingent of plants, reduced still more by the attacks of multitudes of rabbits, whose usual food was much reduced or almost destroyed by the drought. Many swamps, hardly accessible in most years, could be crossed almost dry shod. The effects have been severe on numerous species of wild plants; and the yield of cultivated plants has been much reduced in most places. The older people state that so dry a season is not remembered since 1868. Even early in September the discoloration and fading of the leaves denotes the early oncoming of winter.—JAMES W. H. TRAIL.

Montia verna, Necker.—This more southern form of *Montia* lacks a precise record for Scotland; but I am now able to supply it. When exploring the vicinity of Dunkeld, East Perth, with the members of the Phytogeographical Excursion I noticed this plant in some quantity near Butterstone Loch. In the Herbarium of the Royal Botanic Garden at Edinburgh I also saw a specimen labelled *M. fontana*, from the shore between Queensferry and Burntisland, Fife, collected by A. C. Maingay in 1857. The true *M. fontana*, L. (*M. lamprosperma*, Cham.), is in the same herbarium, from Loch Skene in Dumfries, Maxwellton in Kirkcudbright, King's Park, Edinburgh, Pentlands, Lindores and Inverkeithing Bay in Fife, Arran, Isle of Bute, Glenfarg, Loch Brandy in Forfar, Durris in Kincardine, Blair-Atholl in E. Perth, and St. Kilda, A. H. Gibson, 1859. Most of these belong to the variety *boreo-rivularis*.—G. CLARIDGE DRUCE.

Castalia candida (*Presl.* under *Nymphæa*) in Scotland.—The above plant, which is accorded specific rank in Nyman's Conspectus, etc., was pointed out by Dr. Ostenfeld of Copenhagen in a loch near Dunkeld, E. Perth, to the Members of the International Phytogeographical Excursion through the British Isles, which has been such a feature of this year's field work in Britain. The chief distinctive characters which separate *candida* from *alba* are the pollen grains, which in *candida* are covered with prominent protuberances, while on the grains of *alba* these are obscure, and that in *candida* the ovary is bare of staminate petals in the uppermost part, whereas in *alba* the ovary is clothed to the top. Doubtless, if attention is given to the matter, the plant will be found in other localities. It is found in Sweden, North Germany, etc.—G. CLARIDGE DRUCE.

Hierochloe odorata, *Wahl.*—Only a few days ago I came across a post card from the late Mr. A. Somerville, dated June 14, 1904, in which he quotes a letter from Mr. J. Smith Nicoll of Arbroath. He wrote: "I met a Dundee botanist the other evening, and was showing him the Sedge Collection you kindly sent us. He was able to give me some authentic information regarding Calla Glen, about which you inquired of me recently on behalf of Mr. Bennett. It is at the head of Glen Isla near Canlochan in the extreme west of Forfarshire. He has found Don's Hierochloe in the Glen himself."

Somehow I had missed this notice, and now give it with the hope that some one will give the name of the finder, and see specimens.—A. BENNETT.

Genea verrucosa, *Vitt.*—In Hazelhead Wood near Aberdeen this fungus of the group *Tuberaceæ* is found growing a little under the surface of the ground about the roots of Scotch Fir. Some examples were a little over 1 cm. in diameter.—C. O. FARQUHARSON.

Sagina glabra, *Koch*, in Scotland.—When climbing Ben Lawers in August last with the members of the International Phytogeographical Excursion, I saw a *Sagina* with largish flowers which was new to me; as I was examining it Professor Balfour came up and asked what it was, and at first I could only suggest a large-flowered pentamerous *S. procumbens*, an idea which was negatived almost as soon as uttered. Later on and higher up the hill more specimens were found, and Dr. Ostenfeld suggested that it was a hybrid of *S. saginoides* with *S. procumbens*, but Dr. Graebner and myself were unable to accept this, since the plant was commoner than either of its parents. And although this is not a convincing proof, yet the fact that it has large petals seemed to me a convincing proof of its not bearing that origin.

I believe, however, it may be identified with the continental *Sagina glabra*, Koch, which, however, from its range being apparently

limited to the Alps of Central Europe, is an unexpected extension of its distribution. I may add that I was never on Ben Lawers so late in the year, and this season again is much earlier. The bright sunlight, too, which caused its flowers to open and thus made the plant more conspicuous was a fortunate factor. Further details of the plant and its distribution will follow if, as I hope, it is correctly identified.—G. CLARIDGE DRUCE.

Stellaria palustris, Retz. ["Fl. Scand. Prod.], ed. 2 (1795), p. 106. *S. glauca*, With., "Arr. Brit. Pl.," ed. 3, vol. ii. (1796), p. 420. Scottish botanists should look out for this.

Stellaria Dilleniana, Moench, "En. Pl. Hass.," 1777, t. 6, p. 214.

S. glauca, With., var. *virens*, Meyer, "Ch. Hann.," 1836, p. 198.

S. palustris, Retz, var. *viridis*, Fries., Mant. iii. 1842, p. 191. Richter gives the synonym *S. flaccida*, Peterm., "Fl. Lips.," 1834, p. 324. Found by Dr. Williams in a meadow near Walton-on-Thames Bridge (but on the Surrey side) in Middlesex. The plant differs from *palustris* in being green (not glaucous), its cymes 1-2 flowered, and its late period of flowering, August to October; it is in full flower when *palustris* is well over.

I have it from Surrey near Moulsey Hurst (H. C. Watson, 1847), and A. Bennett, Sept. 1869; Flegg Burgh Fen, E. Norfolk, August 1880, A. Bennett; and I believe a specimen from Newton Stewart, Wigtown, 7, 1897, J. M'Andrew, belongs to *S. Dilleniana*; but it is too poor to decide on.

In Scotland, Perth and Stirling appear to be its northern limits; but in Finnish Lapland it occurs up to 67° 25' N. Lat.,¹ in Russian Lapland to 68° 50' (Saalen); in Sweden north to Vestermanlunds län; the var. *micropetala*, Krok, in Småland, and Upland, Neuman, ("Sverges Fl.," 1901, p. 535), merely notices it as "*f. Dilleniana*, (Moench)."

Dr. Williams² considers that if this is placed as a species, then the species should bear the name *S. Dilleniana*, and *palustris* should become the variety. If placed under *palustris* it becomes *S. palustris*, Retz, var. *Dilleniana*, Blytt, "Norges Flora," 1876, p. 1049. But perhaps this is a case where a sub-species may be adopted, and *S. palustris*, sub-species *Dilleniana* (Moench) used.—A. BENNETT.

Stratiotes aloides in Haddingtonshire.—As this plant is rare in Scotland and does not appear to have been recorded from Haddingtonshire, I may state that I found it in some abundance in a pool in a wood between Haddington and Morham on 16th August 1909.—W. EDGAR EVANS, Edinburgh.

¹ Wainio, "Lap. Fl. Lap. Finland" (1891), p. 61.

² "Journ. of Botany" (1910), p. 223.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—July-September 1911.

[The Editors desire assistance to enable them to make this Section as complete as possible. Contributions on the lines indicated will be most acceptable, and will bear the initials of the Contributor. The Editors will have access to the sources of information undermentioned.]

ZOOLOGY.

THE POSSIBILITIES OF BIRD-MARKING, WITH SPECIAL REFERENCE TO THE ABERDEEN UNIVERSITY BIRD MIGRATION INQUIRY. A. Landsborough Thomson, M.A., M.B.O.U., *Proc. Roy. Phys. Soc. Edin.*, vol. xviii. No. iii. pp. 204-218 (July 1911).

KITE IN SCOTLAND AND OTHER NOTES. D. P. O. Cleave, *Zoologist*, August 1911, p. 317.—A Kite seen on 18th June about 15 miles from Campbeltown. The Osprey, Hen-harrier, and other birds are also recorded in this note.

NOTES ON THE RECENT IMMIGRATION OF MEALY REDPOLLS (*ACANTHIS LINARIA*). William Evans, F.R.S.E., M.B.O.U., *Proc. Roy. Phys. Soc. Edin.*, vol. xviii. No. iii. pp. 196-203 (July 1911).

GREEN SANDPIPER IN SOUTH HARRIS. A. T. A. Ritchie, *The Field*, 26th Aug. 1911, p. 528.—Example shot on 3rd Aug., on a marsh beside Loch Ossigary, near Rodel.

VANESSA CARDUI IN N. MAVINE, SHETLAND. James Waterston, *Ent. Mo. Mag.*, Sept. 1911, p. 217.—Specimen seen on 25th July at Ollaberry.

STERRHA SACRARIA IN SCOTLAND. L. G. Esson, *Entomologist*, Sept. 1911, p. 299.—Female captured on 18th August, at Aberdeen.

A NEW BRITISH HALIPLUS. F. Balfour Browne, F.Z.S., *Ent. Mo. Mag.*, July 1911, p. 153.—The new species is named *nomax* and is reported to occur in Scotland.

A REVISION OF THE BRITISH SPECIES OF LIODES, LATREILLE (*ANISOTOMA*, BRIT. CAT.). Norman H. Joy, M.R.C.S., F.E.S., *Ent. Mo. Mag.*, July and Aug. 1911, pp. 166-179.—*L. stenocoryphe*, sp. nov., described from specimens taken at Forres; *L. picea* also recorded from the same locality.

ADDITIONS AND CORRECTIONS TO THE BRITISH LIST OF MUSCIDÆ ACALYPTRATÆ (CONTINUED). James E. Collin, F.E.S., *Ent. Mo. Mag.*, July 1911, pp. 149-153, and Aug. 1911, pp. 182-187. —Numerous Scottish records are given in this valuable paper.

HYBOS CULICIFORMIS, FAB., IN SCOTLAND. A. E. J. Carter, *Ent. Mo. Mag.*, July 1911, p. 161. —Records the species from various localities in Perthshire, Midlothian, and Haddington.

NOTES ON BRITISH ODONATA IN 1910. W. J. Lucas, *Entomologist*, August 1911, pp. 257-258. —*Æschna juncea* recorded from Caldwell and Kilmalcolm.

BOTANY.

VIOLA CURTISSI. C. E. Salmon (*Journ. Bot.*, 1911, p. 276), records this from "Dunphail, 1850, hb. J. A. Power."

VEGETATIVE REPRODUCTION IN SAGINA NODOSA. By W. G. Travis (*Journ. Bot.*, 1911, pp. 270-273). Observations made on the Lancashire coast, on its multiplication by axillary buds or bulbils.

VICIA SYLVATICA, L., *var.* CONDENSATA. By G. Claridge Druce (*Journ. Bot.*, 1911, pp. 234-235). Found on shingle in Wigtown, on cliffs in Forfar, etc. Seeds sown in garden soil reproduced the variety.

DEESIDE MOSSES. By Edward Richards (*Journ. Bot.*, 1911, pp. 232-233). Several new county records from the basin of the Dee, from Pannanich near Ballater upwards.

BOOK NOTICES.

THE FRESHWATER FISHES OF THE BRITISH ISLES. By C. Tate Regan, M.A., Zoological Department, British Museum. London: Methven and Co., 1911. 6s. net.

A popular work on any group of British animals by a writer who is a recognised authority is always acceptable, and Mr. Tate Regan's book will be welcomed by both naturalists and anglers. The former will appreciate it for the up-to-date information which they will not find collected together elsewhere, for much has been added to our knowledge of British Freshwater Fishes during recent years. The angler will find the book a safe guide, which he sadly needs, regarding the true value of the various forms, especially of the Trout and Charr. The Salmonidæ, which have long been a

puzzling group, have received much attention from Mr. Regan, and we accept the results of his investigations and opinions regarding them with confidence. The chapters devoted to them form a most important and interesting and authoritative contribution. The accounts of the rest of the species, and the results of recent researches into their life-histories, are excellent, and the author is to be congratulated on the interesting manner in which he has treated his subject. There are also valuable chapters devoted to Classification and Taxonomy, while one on the Origin and Geographical Distribution of the various species, with special reference to the racial forms peculiar to our islands, forms a fitting conclusion to an admirable book. The volume is adequately illustrated by no less than 37 excellent plates and numerous test figures drawn by the author, all of which are most helpful adjuncts to the letterpress.

WILD BIRDS AT HOME (Fifth Series). Sixty photos from life by Arthur Brook, of "British Birds and their Nests." With notes by George Girdwood. London and Glasgow: Gowans and Gray, 1911. Price 6d.

This little book is composed of a remarkably fine series of photographs depicting the life and habits of various British birds. To each portrait is affixed the name of the bird in English, French, German, and Latin, whilst an Appendix affords notes in which the characteristic ways and habits of the different birds are briefly but clearly described. This is the fifth series of the "Wild Birds at Home," a series which deserves to be popular as a unique collection of bird photographs *en miniature*. G. E. G.-M.

A MONOGRAPH OF THE BRITISH ANNELIDS. Vol. II. Part II.—Polychæta: Syllidæ to Ariciidæ. Pp. 233-524; Plates li.-lvi. coloured, and lxxi.-lxxxvii. uncoloured. By Prof. W. C. M'Intosh, M.D., F.R.S., etc. Ray Society, 1910.

In the July 1908 number of the "Annals" we took notice of Part I. of the second volume of Prof. M'Intosh's monumental work. We have now to chronicle the issue of Part II. of that volume. About 70 species, belonging to the Families Syllidæ, Nereidæ, Eunicidæ, Goniadidæ, Glyceridæ, and Ariciidæ, are therein described and illustrated. Of the beautiful coloured plates, on which something like one-half of the species are figured, it is impossible to speak too highly. An Index to the species, etc., described in Vol. I. is inserted at the end of the part.—W. E.

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No. 77]

1911

[JANUARY

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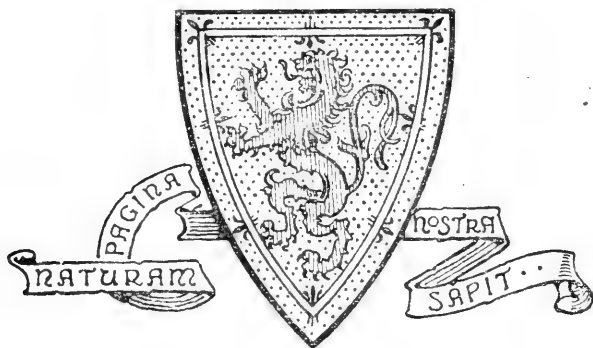
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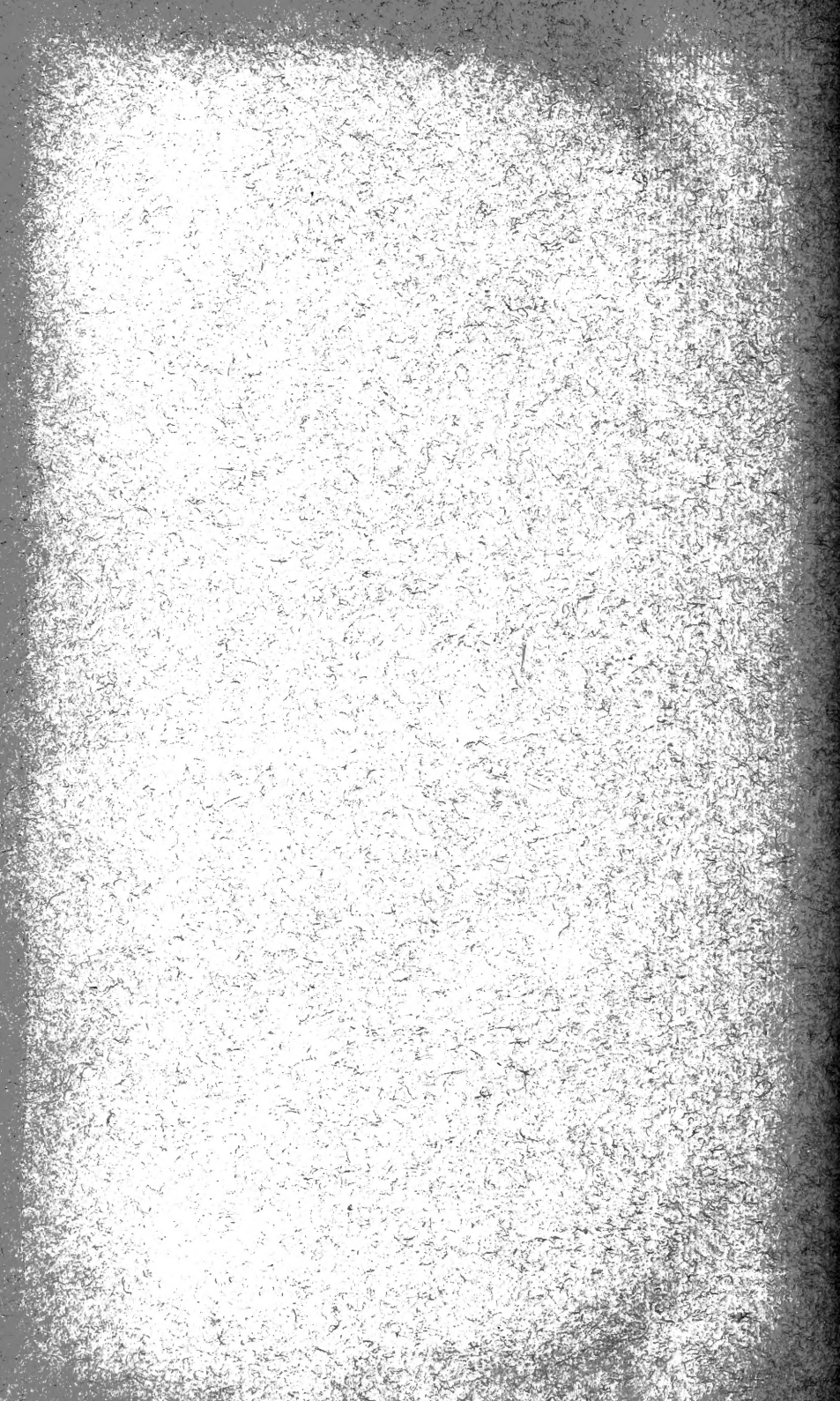
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